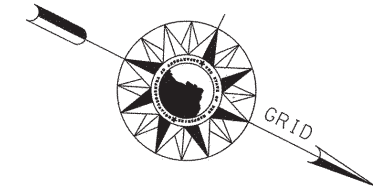
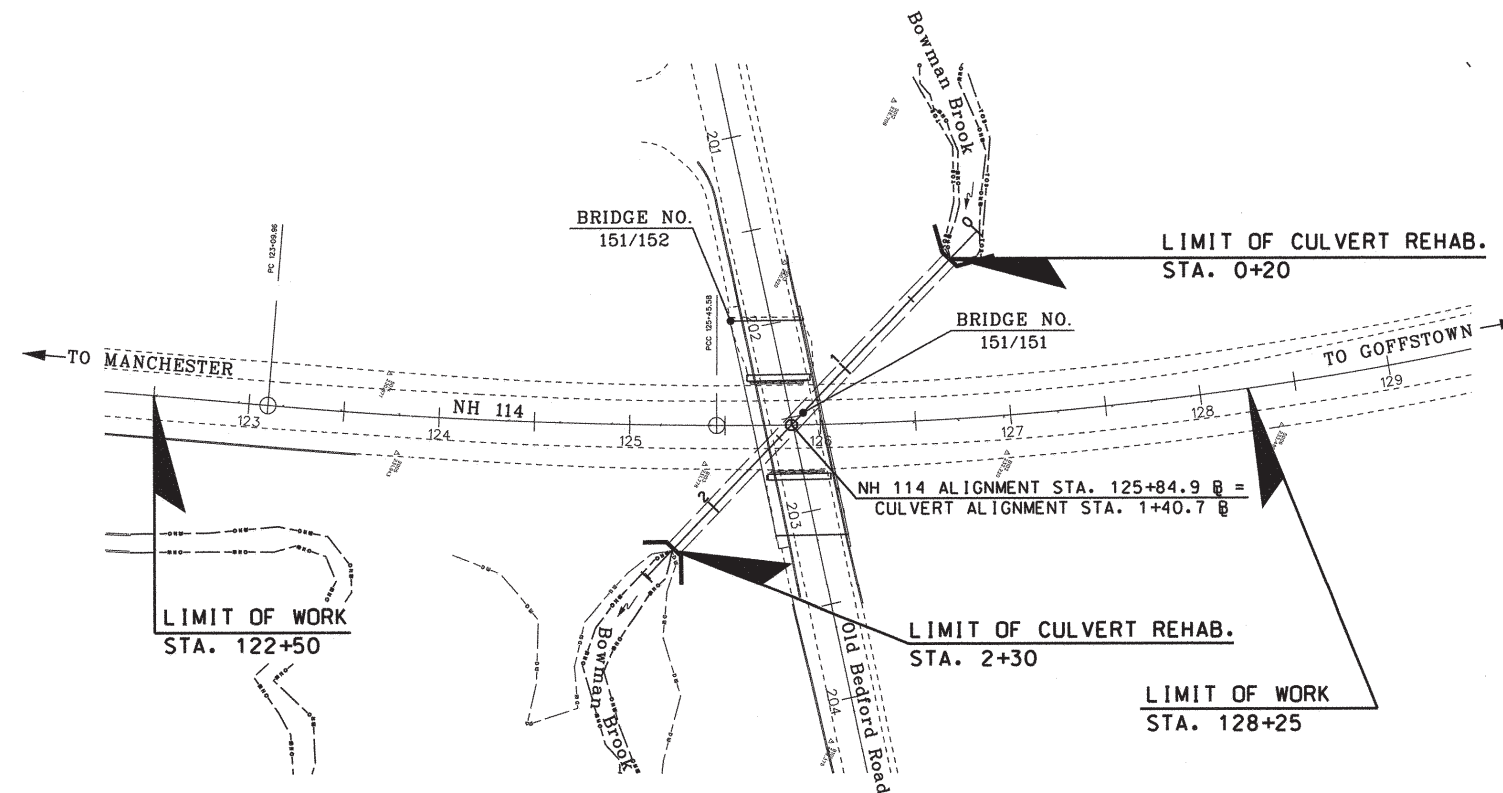
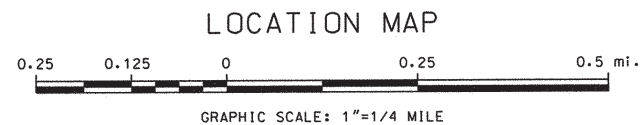
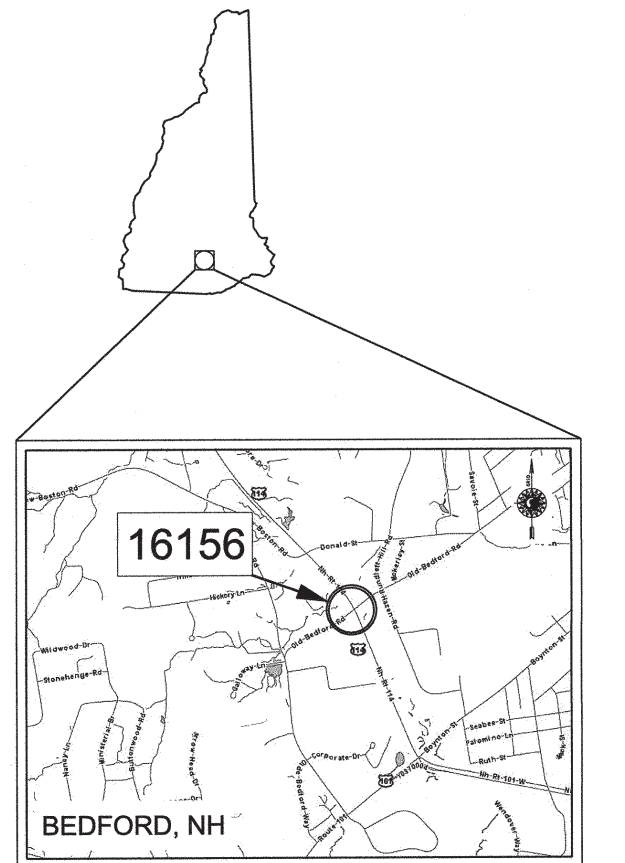


THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLANS

FEDERAL PROJECT X-A001 (160)
NH PROJECT NO. 16156
NH ROUTE 114
BOWMAN BROOK CULVERT REHABILITATION

DESIGN DATA	
AVERAGE DAILY TRAFFIC 2016	22,000
AVERAGE DAILY TRAFFIC 2036	
PERCENT OF TRUCKS	5%
DESIGN SPEED	45 MPH
LENGTH OF 16156 PROJECT	0.11 MILE

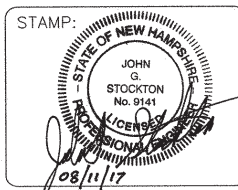


DRAWN BY TJW DATE 05/2017
CHECKED BY DEM DATE 05/2017

PLANS PREPARED BY:

STANTEC CONSULTING SERVICES, INC
288 SOUTH RIVER ROAD, BUILDING C, BEDFORD, NH 03110
TEL (603) 669-2000 FAX (603) 668-2670

STAMP:



TOWN OF BEDFORD
COUNTY OF HILLSBOROUGH

SCALE: 1" = 50'

NHDOT		THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION	
RECOMMENDED FOR APPROVAL		8/15/2017	
DIRECTOR OF PROJECT DEVELOPMENT		DATE	
APPROVED: <i>William J. ...</i>		8/16/17	
ASSISTANT COMMISSIONER AND CHIEF ENGINEER		DATE	
FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A001(160)	16156	1	23

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE PAGE
2	INDEX OF SHEETS AND GENERAL NOTES
3,4	STANDARD SYMBOLS
5	ACCESS TYPICAL SECTION
6	SUMMARY OF QUANTITIES
	<u>BRIDGE PLANS</u>
7-23	NH ROUTE 114 OVER BOWMAN BROOK (BRIDGE NO. 151/151)

GENERAL NOTES

- ①

FOR STANDARD PLANS, SEE "STANDARD PLANS FOR ROAD CONSTRUCTION" DATED 2010 (A BOUND BOOK).
- ②

HIGH TENSION OVERHEAD TRANSMISSION LINES ARE LOCATED THROUGHOUT THE PROJECT WITH CROSSINGS AT VARIOUS LOCATIONS AND RUNNING ALONG THE ROAD THROUGHOUT THE PROJECT EVEN ON REGULAR POLES. THE CONTRACTOR IS ADVISED THAT EXTREME CAUTION WILL BE REQUIRED IN THE OPERATION OF EQUIPMENT, ESPECIALLY CRANES AND PILE DRIVING EQUIPMENT.
- ③

MODIFY SUPERELEVATION ON EXISTING CURVES BY THE USE OF A LEVELING COURSE TO THE RATES INDICATED ON THE PLANS OR AS ORDERED.
- ④

EXISTING DELINEATORS AND WITNESS MARKERS THAT ARE REMOVED AND DETERMINED BY THE ENGINEER TO BE IN ACCEPTABLE CONDITION SHALL BE RESET (SUBSIDIARY). ADDITIONAL DELINEATORS AND WITNESS MARKERS ORDERED WILL BE PAID UNDER THE APPROPRIATE ITEMS OF THE CONTRACT.
- ⑤

NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
- ⑥

PERFORM ALL WORK WITHIN THE EXISTING RIGHT-OF-WAY, UNLESS OTHERWISE SHOWN ON THE PLANS OR AS ORDERED BY THE ENGINEER.
- ⑦

REMOVE UNPROTECTED PROJECT MARKERS (SUBSIDIARY).
- ⑧

SURVEY DATA FOR THIS PROJECT WAS COLLECTED BY SDR AND THE FIELD NOTES CAN BE FOUND IN THE SURVEY FIELD BOOK(S) 13399 & 10096. COORDINATES ARE NEW HAMPSHIRE STATE PLANE COORDINATES OF NAD83, 1986 ADJUSTMENT AND THE BEARINGS ARE GRID. ELEVATIONS ARE REFERENCED TO NGVD 1929.
- ⑨

QUANTITIES FOR EMBANKMENT AND EXCAVATION FOR SLOPE ROUNDINGS AS SHOWN ON THE TYPICALS HAVE NOT BEEN CALCULATED AND ARE NOT INCLUDED IN THE QUANTITY SUMMARIES, AND ARE CONSIDERED SUBSIDIARY TO THE APPROPRIATE 203 ITEMS.

THE FOLLOWING GENERAL NOTES WILL BE USED ON THIS PROJECT:											
①	②	○	④	⑤	⑥	⑦	⑧	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
INDEX OF SHEETS AND GENERAL NOTES				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	02_index_sheet	16156	2	23

GENERAL

EDGE OF PAVEMENT
TRAVELED WAY

PROPOSED ROADWAY

existing roadway

(pavement removed outside slope lines)

DRIVEWAYS

(label surface type)

BUILDINGS

(label house or type of building)

FOUNDATION

(label type)

LEACH FIELD

leach field

BRIDGE CROSSINGS

STREAM

OVERPASS

STEPS AND WALK

(label type)

INTERMITTENT WATER COURSE

SHORE LINE

river/stream

pond (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)

(deciduous)(coniferous) (stump)

TREE OR STUMP (CROSS-SECTIONS)

(show station, circumference in feet & type)

HEDGE

(label type)

MONITORING WELL

mon W

WELL

W

FLAG POLE

fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)

FENCE (LABEL TYPE)

SIGNS

(single post)

(double post)

GAS PUMP

FUEL TANK (ABOVE GROUND)

STORAGE TANK FILLER CAP

SEPTIC TANK

GRAVE

MAILBOX

VENT PIPE

SATELLITE DISH ANTENNA

PHONE

GROUND LIGHT/LAMP POST

BORING LOCATION

TEST PIT

INTERSTATE NUMBERED HIGHWAY

UNITED STATES NUMBERED HIGHWAY

STATE NUMBERED HIGHWAY

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE

DELINEATED WETLAND

ORDINARY HIGH WATER

TOP OF BANK

TOP OF BANK & ORDINARY HIGH WATER

NORMAL HIGH WATER

WIDTH AT BANK FULL

PRIME WETLAND

PRIME WETLAND 100' BUFFER

NON-JURISDICTIONAL DRAINAGE AREA

COWARDIN DISTINCTION LINE

TIDAL BUFFER ZONE

DEVELOPED TIDAL BUFFER ZONE

HIGHEST OBSERVABLE TIDE LINE

MEAN HIGH WATER

MEAN LOW WATER

VERNAL POOL

SPECIAL AQUATIC SITE

REFERENCE LINE

WATER FRONT BUFFER

NATURAL WOODLAND BUFFER

PROTECTED SHORELAND

INVASIVE SPECIES LABEL

INVASIVE SPECIES

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY

100 YEAR FLOODPLAIN BOUNDARY

FLOODWAY

ENGINEERING

CONSTRUCTION BASELINE

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

CLEARING LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

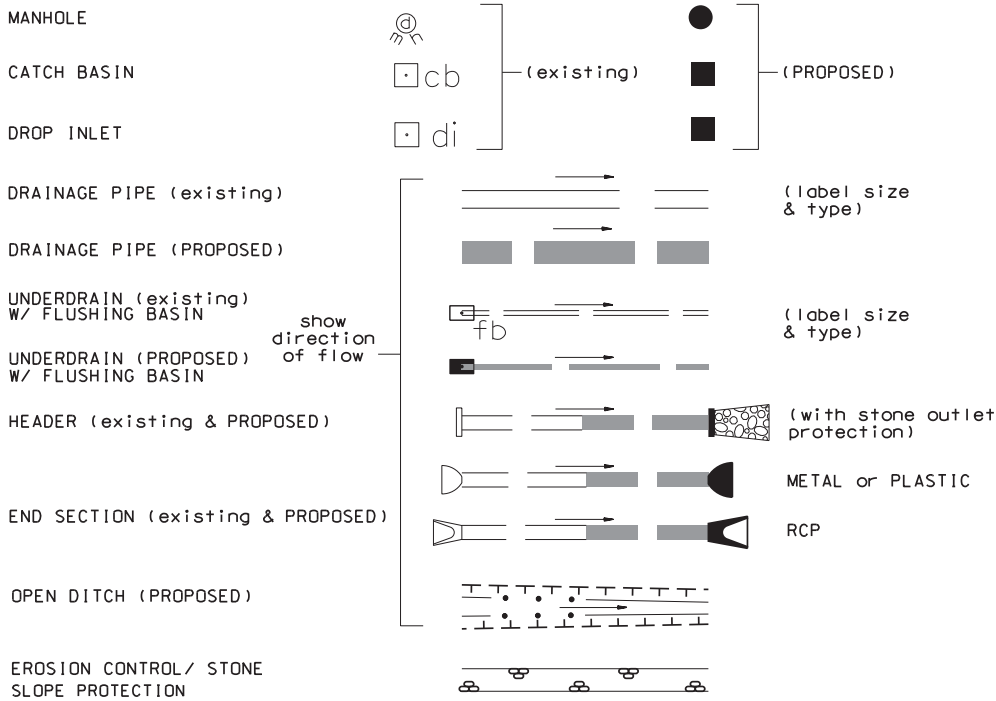
PROFILES AND CROSS SECTIONS:

ORIGINAL GROUND ELEVATION (LEFT)

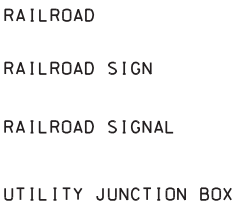
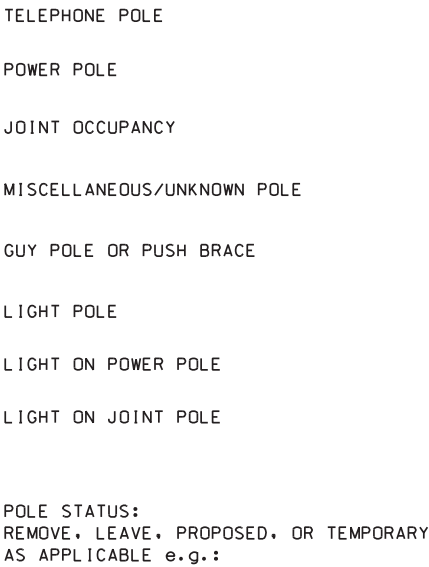
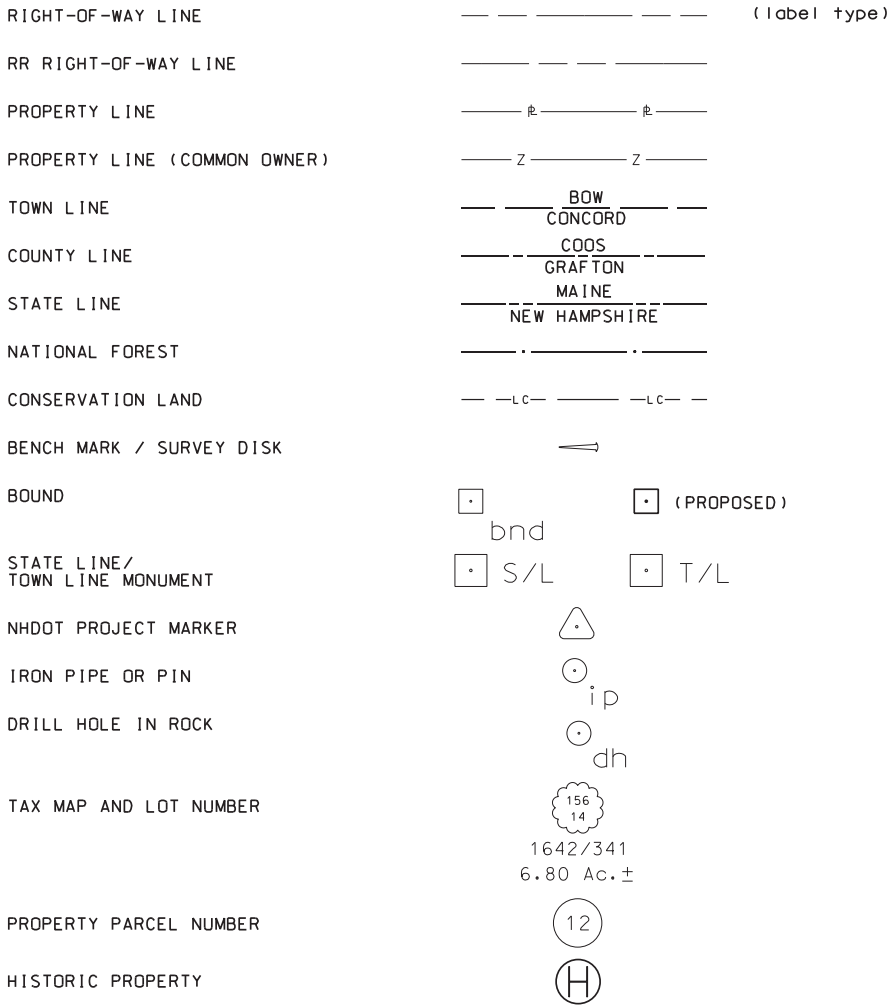
FINISHED GRADE ELEVATION (RIGHT)

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	03_stdsym1	16156	3	23

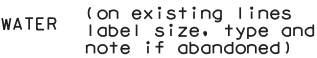
DRAINAGE



BOUNDARIES / RIGHT-OF-WAY



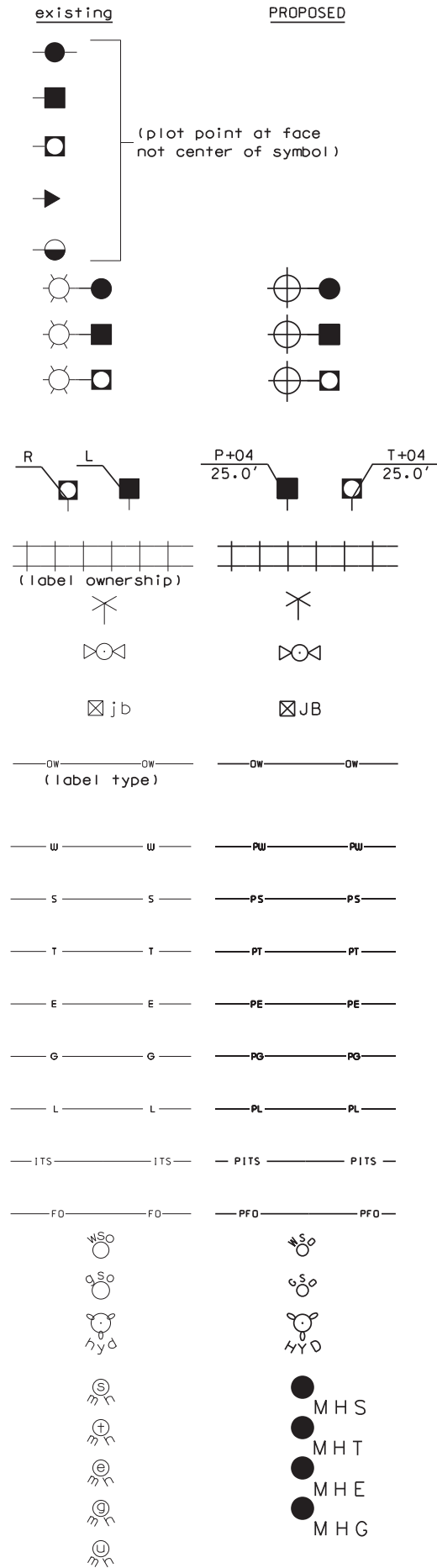
UNDERGROUND UTILITIES



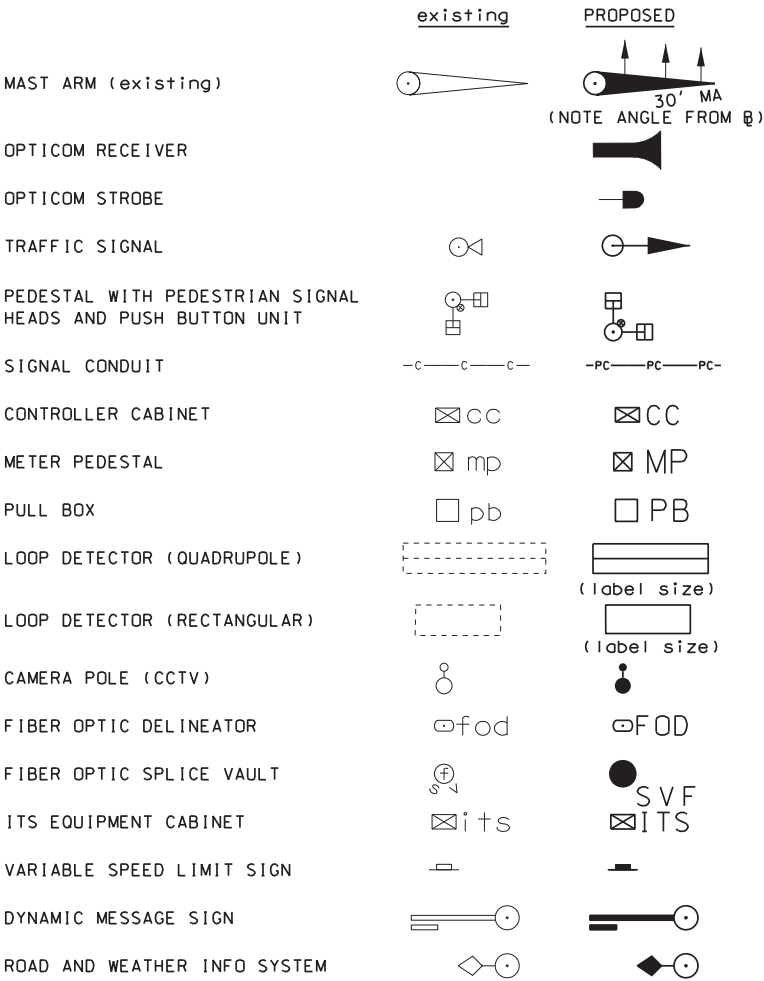
MANHOLES



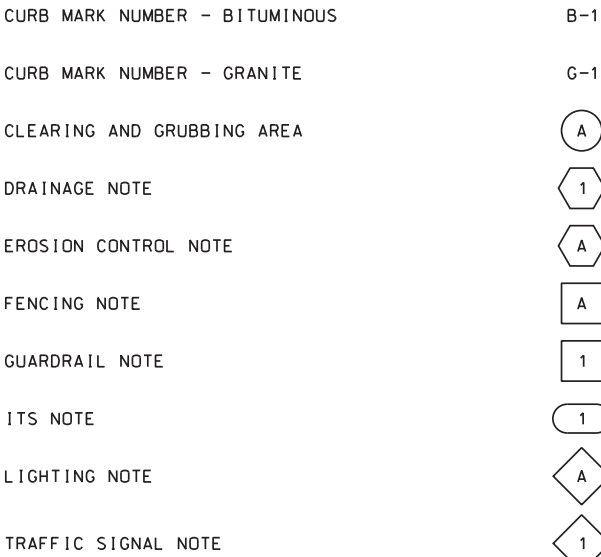
UTILITIES



TRAFFIC SIGNALS / ITS



CONSTRUCTION NOTES



SHEET 2 OF 2

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	04_s+dsymb2	16156	4	23

SDR PROCESSED		NRDOT	DATE	REVISIONS AFTER PROPOSAL			
NEW DESIGN	TJW	DATE	08/2017	NUMBER	DATE	STATION	DESCRIPTION
SHEET CHECKED	DEM	DATE <td>08/2017</td> <td></td> <td></td> <td></td> <td></td>	08/2017				
AS BUILT DETAILS							

SUMMARY OF QUANTITIES (ESTIMATED)
THIS INFORMATION IS FOR BIDDING PURPOSES ONLY

DRAINAGE SUMMARY

REF. NO.	REMOVAL OF EXSTING PIPE 0-24" DIAMETER	REMOVAL OF EXSTING PIPE OVER 24" DIAMETER	UNCLASSIFIED CHANNEL EXCAVATION	RIPRAP, CLASS V	SIMULATED STREAMBED MATERIAL	GEOTEXTILE; PERM. CONTROL CL. 1, NON-WOVEN	CENTRIFUGALLY CAST CONCRETE LINER FOR 90" CMP	15" R.C. PIPE, 2000D	12" CORR. POLYETHYLENE END SECTION	12" TEMPORARY DRAIN PIPE	STEEL WITNESS MARKERS	REMARKS
	202.41	202.42	207.3	563.5	585.3401	593.411	602.41190	603.00215	603.33212	603.99012	622.1	
	LF	LF	CY	CY	CY	SY	LF	LF	EA	LF	EA	
NH ROUTE 114												
B1							210	16				
B2		14	165	85	15	142		16			1	
B3		14	197	123	16	182					1	
E1	19											REMOVE 19' x 15" RCP
E2												REMOVE 21' x 15" RCP
E3	21											
T1									1	68		
T2												REMOVE 68' x 12" TEMP. DRAIN PIPE & END SECTION (SUBSIDIARY TO NOTE T1)
SUB-TOTAL	40	28	362	208	31	324	210	32	1	68	2	
ROUNDING	0	2	8	2	4	26	0	0	0	2	0	
TOTAL	40	30	370	210	35	350	210	32	1	70	2	

INCIDENTAL ITEMS			
ITEM NO.	ITEM	QUANTITY	UNIT
201.1	CLEARING AND GRUBBING (F)	0.1	A
201.881	INVASIVE SPECIES CONTROL TYPE I	350	SY
202.7	REMOVAL OF GUARDRAIL	390	LF
203.11	COMMON EXCAVATION - LRS	410	CY
203.55543	GUARDRAIL EAGRT OFFSET PLATFORM, TL3	1	U
203.601	EMBANKMENT IN PLACE	20	CY
206.19	COMMON STRUCTURE EXCAVATION EXPLORATORY	70	CY
304.32	CRUSHED GRAVEL FOR SHOULDER LEVELING	25	TON
606.012	W6X9 STEEL POST REPLACEMENTS FOR BEAM GUARDRAIL POSTS	15	EA
606.0122	W6X9 STEEL POST ASSEMBLIES FOR BEAM GUARDRAIL POSTS	15	EA
606.1254	BEAM GUARDRAIL (TERMINAL UNIT TYPE EAGRT, TL 3) (STEEL POST)	1	U
606.18001	31" W-BEAM GUARDRAIL WITH 8" OFFSET BLOCK (STEEL POST)	350	LF
606.34202	SINGLE FACED ASYMMETRICAL TRANSITION RAIL, RIGHT (STEEL POST)	2	U
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	400	LF
606.91	RESETTING OR SETTING GUARDRAIL	25	LF
606.9513	TEMP. IMPACT ATTENUATION DEVICE (REDIRECTIVE) TEST LEVEL 3	4	U
615.034	RELOCATING TRAFFIC SIGN, TYPE C	1	U
618.61	UNIFORMED OFFICERS WITH VEHICLE	*	\$
618.7	FLAGGERS	250	HR
619.1	MAINTENANCE OF TRAFFIC	1	U
619.25	PORTABLE CHANGEABLE MESSAGE SIGN	2	U
621.2	RETROREFLECTIVE BEAM GUARDRAIL DELINEATOR	6	EA
621.31	SINGLE DELINEATOR WITH POST	4	EA
621.32	DOUBLE DELINEATOR WITH POST	1	EA
632.0104	RETROREFLECTIVE PAINT PAVE. MARKING, 4" LINE	2300	LF
643.22	FERTILIZER FOR REFERTILIZATION	0.3	TON
645.3	EROSION STONE	350	TON
645.44	TEMPORARY SLOPE STABILIZATION, TYPE D (WILDLIFE FRIENDLY)	2450	SY
645.512	COMPOST SOCK FOR PERIMETER BERM	1100	LF
645.52	RYEGRASS FOR TEMPORARY EROSION CONTROL	50	LB
645.531	SILT FENCE	1100	LF
645.7	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)	1	U
645.71	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS	90	HR
646.4	TURF ESTABLISHMENT WITH MULCH, TACKIFIERS AND HUMUS	0.6	A
670.104	TEMPORARY PORTABLE LIGHTING	2	U
692.	MOBILIZATION	1	U
697.11	INVASIVE SPECIES CONTROL AND MANAGEMENT PLAN	1	U
697.31	PROJECT OPERATIONS PLAN	1	U
699.	MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL	*	\$
1010.15	FUEL ADJUSTMENT	*	\$

* NOT A BID ITEM

500.0201 - ACCESS FOR BRIDGE CONSTRUCTION			
SUBSIDIARY ITEMS			
ITEM NO.	ITEM	QUANTITY	UNIT
203.1	COMMON EXCAVATION	144	CY
203.601	EMBANKMENT-IN-PLACE	65	CY
304.301	CRUSHED GRAVEL	36	CY
NOTE: THIS LIST SHOULD NOT BE CONSIDERED TO BE A LIST OF ALL SUBSIDIARY WORK PRESENT IN THE PROJECT. REFER ALSO TO THE PROPOSAL, SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.			

ITEM 500.0202 - ACCESS FOR BRIDGE CONSTRUCTION			
SUBSIDIARY ITEMS			
ITEM NO.	ITEM	QUANTITY	UNIT
203.1	COMMON EXCAVATION	90	CY
203.601	EMBANKMENT-IN-PLACE	52	CY
304.301	CRUSHED GRAVEL	23	CY
NOTE: THIS LIST SHOULD NOT BE CONSIDERED TO BE A LIST OF ALL SUBSIDIARY WORK PRESENT IN THE PROJECT. REFER ALSO TO THE PROPOSAL, SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS.			

PERMANENT CONSTRUCTION SIGN TABLE									
(INCLUDED IN ITEM NO. 619.1)									
SIGN NO.	DESCRIPTION	SIZE (ft)		SF	NO. REQ.	TOTAL AREA (SF)	PORTABLE MOUNTS	U-CHANNEL POSTS	REMARKS
		W	H						
G20-2A	"END ROAD WORK"	4	2	8	4	32	4		BLACK/ORANGE
R50-1	"NH LAW WORK ZONE"	6	4	24	2	48	2		BLACK/WHITE
W20-1a	"ROAD WORK AHEAD"	4	4	16	2	32	2		BLACK/FLUORESCENT ORANGE
W20-1b	"ROAD WORK 500 FT"	4	4	16	2	32	2		BLACK/FLUORESCENT ORANGE
W20-1c	"ROAD WORK 1000 FT"	4	4	16	2	32	2		BLACK/FLUORESCENT ORANGE
W20-1e	"ROAD WORK 1/2 MILE"	4	4	16	2	32	2		BLACK/FLUORESCENT ORANGE
NOTE: The estimated quantities of "Permanent Controls" are hereby listed. The contractor is responsible for all "Operational Controls" required under section 619 of the NHDOT Specifications and the Manual of Uniform Traffic Control Devices (MUTCD), Part									



STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
SUMMARY OF QUANTITIES			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
06_QSS	16156	6	23

INDEX OF BRIDGE SHEETS	
NO.	SHEET TITLE
1	GENERAL PLAN
2	BRIDGE NOTES
3	SITE PLAN
4	ROADWAY AND CONSTRUCTION ACCESS PLAN
5	WATER DIVERSION PLAN
6	BORING LOGS (SHEET 1 OF 4)
7	BORING LOGS (SHEET 2 OF 4)
8	BORING LOGS (SHEET 3 OF 4)
9	BORING LOGS (SHEET 4 OF 4)
10	INLET FOOTING DETAILS
11	INLET HEADWALL DETAILS
12	INLET WINGWALL DETAILS
13	OUTLET FOOTING DETAILS
14	OUTLET HEADWALL DETAILS
15	OUTLET WINGWALL DETAILS
16	CULVERT INLET AND OUTLET DETAILS
17	REINFORCING SCHEDULE

HYDRAULIC DATA

DRAINAGE AREA:	3.67 SQ MI.
DESIGN FLOOD Q ₁₀₀ :	710 CFS
DESIGN VELOCITY:	2.11 FT/SEC
DESIGN FLOOD ELEVATION:	235.43
Q ₁₀₀ ELEVATION:	235.43
Q ₅₀ ELEVATION:	232.83
Q ₁₀ ELEVATION:	225.23



STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN

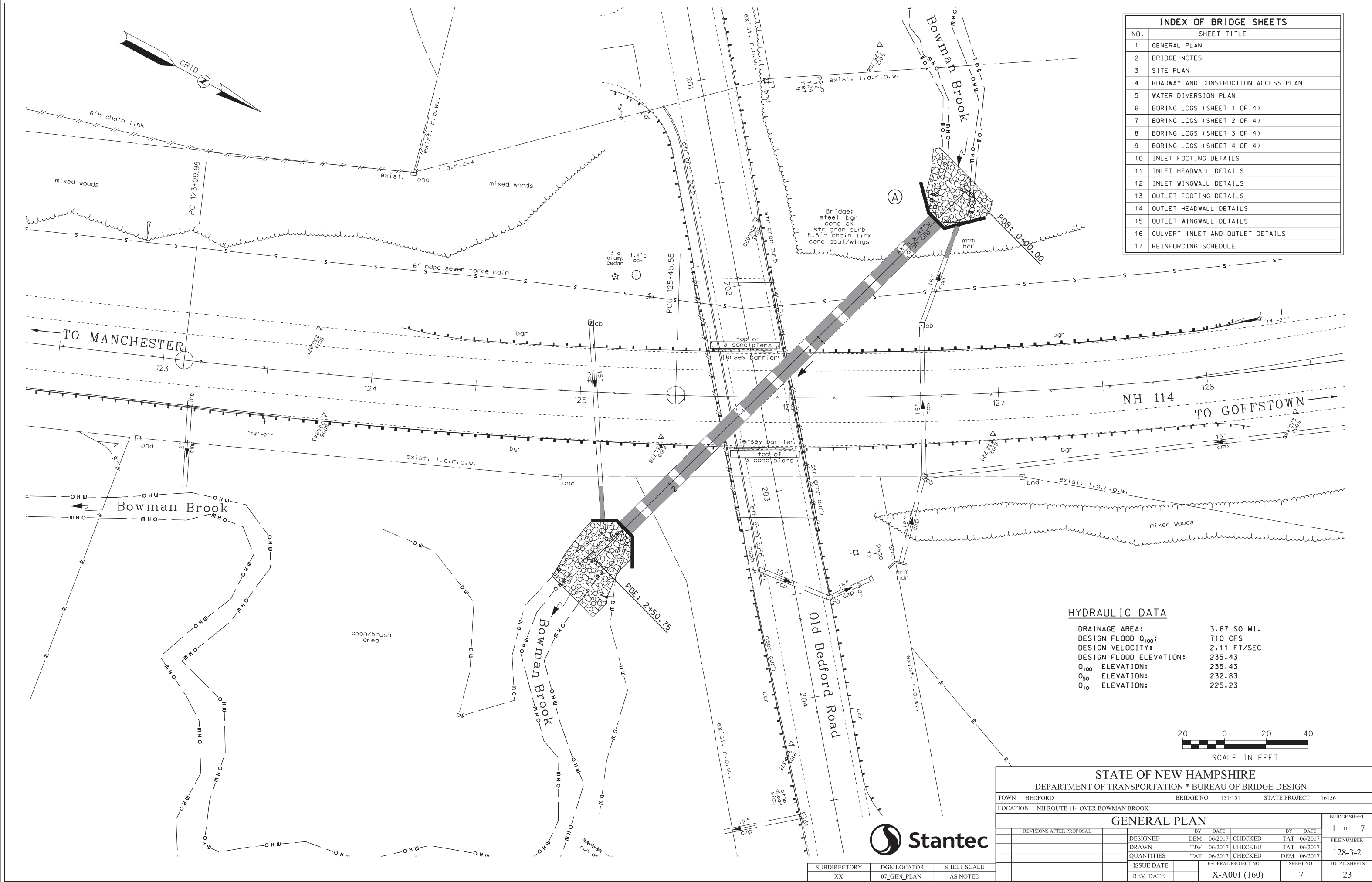
TOWN BEDFORD

BRIDGE NO. 151/151

STATE PROJECT 16156

LOCATION NH ROUTE 114 OVER BOWMAN BROOK

GENERAL PLAN						BRIDGE SHEET
REVISIONS AFTER PROPOSAL						1 OF 17
DESIGNED	DEM	06/2017	CHECKED	TAT	06/2017	FILE NUMBER
DRAWN	TJW	06/2017	CHECKED	TAT	06/2017	128-3-2
QUANTITIES	TAT	06/2017	CHECKED	DEM	06/2017	TOTAL SHEETS
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		
REV. DATE		X-A001 (160)		7		23



SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	07_GEN_PLAN	AS NOTED

DESIGN LOADS, MATERIALS AND SPECIFICATIONS

1. DESIGN LOADING: HL-93
2. DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (LRFD)
3. SPECIFICATIONS: AASHTO 2014 LRFD BRIDGE DESIGN SPECIFICATIONS AS AMENDED
AASHTO BRIDGE CONSTRUCTION SPECIFICATIONS WITH INTERIMS
NHDOT 2016 STANDARD SPECIFICATIONS FOR ROAD & BRIDGE
CONSTRUCTION AS AMENDED
4. FOUNDATION DATA: REINFORCED CONCRETE FOOTINGS SUPPORTED ON BEDROCK WITH
ONE FOOT OF STRUCTURAL FILL. NOMINAL BEARING RESISTANCE
OF 12 TSF WITH A 0.45 RESISTANCE FACTOR. NOMINAL
SLIDING RESISTANCE (TAN δ) OF 34 DEGREES WITH A 0.8
RESISTANCE FACTOR.
5. REINFORCING STEEL: AASHTO M31 (ASTM A615) GRADE 60
6. CONCRETE:
FOOTINGS:
ITEM 520.213, CONCRETE CLASS B, FOOTINGS (ON SOIL) (F)
3000 psi
HEAADWALLS AND WINGWALLS:
ITEM 520.12, CONCRETE CLASS A, ABOVE FOOTINGS (F)
3000 psi

GENERAL NOTES

1. EXISTING BRIDGE PLANS ARE AVAILABLE ON-LINE IN THE BID PACKAGE ON THE INVITATION TO
BID WEB PAGE DURING THE BIDDING PERIOD. AFTER THE CONTRACT HAS BEEN AWARDED, A SET
OF EXISTING PLANS WILL BE FORWARDED TO THE CONTRACTOR UPON REQUEST.
2. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF THE EXISTING
STRUCTURES AND SHALL BE PREPARED TO MAKE ANY ADJUSTMENTS REQUIRED TO PROPERLY COMPLETE
THE CONSTRUCTION OF PROPOSED STRUCTURES.
3. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT DEBRIS DOES NOT FALL
INTO THE WATERWAY. THE WATER LEVEL OF THE BOWMAN BROOK MAY VARY FROM WHAT WHICH IS SHOWN.
ALL COSTS FOR PROTECTIVE STRUCTURES OR SHIELDING REQUIRED OR ORDERED SHALL BE PAID UNDER
ITEM 202.42 AND SHALL INCLUDE ERECTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURES
OR OTHER SUCH METHODS AS APPROVED BY THE ENGINEER.
4. NO SCAFFOLDS SHALL BE ERECTED OR OPERATIONS CONDUCTED IN THE WATERWAY, UNLESS APPROVED BY
THE ENGINEER.
5. NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING
PROVISIONS FOR RELOCATION.
6. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ¾", UNLESS NOTED OTHERWISE.
7. SHEAR KEYS SHALL BE 3" HIGH BY ONE-THIRD THE THICKNESS OF THE WALL, CENTERED, UNLESS
NOTED OTHERWISE.
8. FOR BORING NOTES SEE BRIDGE SHEET 6.
9. FOR HYDRAULIC DATA SEE BRIDGE SHEET 1.

CONSTRUCTION ACCESS NOTES

1. ITEM 500.0201 AND 500.0202, ACCESS FOR BRIDGE CONSTRUCTION, SHALL INCLUDE THE DESIGN,
CONSTRUCTION, MAINTENANCE, AND REMOVAL OF ALL TEMPORARY ACCESS MEASURES SELECTED BY THE
CONTRACTOR FOR THE BRIDGE CONSTRUCTION, INCLUDING ACCESS ACROSS BOWMAN BROOK BETWEEN THE
HEADWALLS AND WINGWALLS AND ACCESS FROM THE ROADWAY DOWN TO THE BROOK LEVEL AT BOTH
HEADWALLS. SEE THE SPECIAL PROVISION FOR ITEMS 500.0201 AND 500.0202 FOR ADDITIONAL
INFORMATION.
2. TEMPORARY FILLS CONSTRUCTED ACROSS WETLAND AREAS UNDER THIS ITEM SHALL BE LOCATED
WITHIN THE ALLOWABLE WETLAND IMPACT AREAS SHOWN ON THE WETLAND PERMIT AND WITHIN THE
EASEMENTS SHOWN ON THE SITE PLAN. CLEAN STONE WITH UNDERLYING GEOTEXTILE SHALL BE
USED FOR THE TEMPORARY FILLS WITHIN THE WETLAND IMPACT AREAS. ALL COSTS SHALL BE
SUBSIDIARY TO ITEM 500.0201 AND 500.0202.

REINFORCEMENT NOTES

1. REINFORCEMENT IN THE BOTTOM OF FOOTINGS SHALL HAVE 3" MINIMUM CLEAR COVER.
ALL OTHER REINFORCEMENT SHALL HAVE A 2½" MINIMUM CLEAR COVER, UNLESS OTHERWISE
NOTED.
2. PLACE REINFORCING STEEL TO AVOID WEEPERS.
3. REINFORCING LEGEND: SP = SPACE, SPL = SPLICE, FS = FAR SIDE, NS = NEAR SIDE,
BOT = BOTTOM, ALT = ALTERNATING, DOW = DOWEL.
4. REINFORCING SHALL BE PAID UNDER ITEM 544, REINFORCING STEEL (F).

HEADWALL AND WINGWALL NOTES

1. WEEPERS SHALL BE PLACED SYMMETRICALLY 10'-0" APART AND CENTERED AT 12" ABOVE
THE TOP OF FOOTING. WEEPERS SHALL BE 4" DIAMETER AND SLOPED TO DRAIN AT
12:1. ALL COSTS WILL BE SUBSIDIARY TO ITEM 520.12.
2. ITEM 538.2, BARRIER MEMBRANE, PEEL AND STICK - VERTICAL SURFACES (F), 2' WIDE,
SHALL BE PLACED CENTERED OVER ALL VERTICAL CONSTRUCTION JOINTS WITH PROTECTION
BOARD (SUBSIDIARY).
3. ITEM 534.3, WATER REPELLENT (SILANE-SILOXANE), SHALL BE APPLIED TO ALL EXPOSED
CONCRETE SURFACES OF HEADWALLA AND WINGWALLS TO 1'-0" BELOW FILL LINES.

EXISTING CULVERT REMOVAL NOTES

1. ITEM 202.42., REMOVAL OF EXISTING PIPE, OVER 24" DIAMETER, UNLESS OTHERWISE SHOWN
ON THE PLANS, SHALL INCLUDE THE FOLLOWING:

- COMPLETE REMOVAL OF THE MITERED END PORTIONS OF THE EXISTING CULVERT TO THE
LIMITS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. DURING REMOVAL OPERATIONS, EXTREME CARE SHALL BE TAKEN NOT TO DAMAGE THE
EXISTING CULVERT THAT IS TO REMAIN IN PLACE. ANY DAMAGE SHALL BE IMMEDIATELY
REPORTED TO THE ENGINEER AND REPAIRED AS DIRECTED, AT THE CONTRACTOR'S EXPENSE.
3. EXCAVATION, TEMPORARY EARTH SUPPORT AND GRADING, AND BACKFILL NOT INCLUDED
IN OTHER ITEMS, BUT REQUIRED FOR REMOVAL OF THE EXISTING STRUCTURE SHALL BE
SUBSIDIARY TO ITEM 202.42.

COFFERDAM NOTES

1. ALL COFFERDAM ITEMS COVERED UNDER SECTION 503 OF THE SPECIFICATIONS SHALL BE
DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NH. THE CONTRACTOR
SHALL SUBMIT STAMPED WORKING DRAWINGS AND CALCULATIONS FOR DOCUMENTATION IN
ACCORDANCE WITH 105.02.
2. THE COFFERDAM ITEMS ARE INCLUDED IN THE CONTRACT FOR THE PURPOSE OF SUPPORTING
EXCAVATIONS FOR THE INLET AND OUTLET HEADWALLS AND WINGWALLS BELOW OVERLYING
FACILITIES (e.g., EXISTING SEWER AND ROADWAY). EXCAVATION BACKSLOPES IN SOIL BELOW
THE OVERLYING FACILITIES SHALL BE NO STEEPER THAN 1.5H:1V. FLATTER BACKSLOPES SHALL
BE USED IF THE CONTRACTOR'S STABILITY CALCULATIONS INDICATE INSUFFICIENT SOIL SLOPE
STABILITY AT 1.5H:1V.
3. THE LOCATION AND LIMITS OF THE COFFERDAMS DETAILED ON THE PLANS ARE SCHEMATIC AND
NOT INTENDED FOR FINAL DESIGN OF THE COFFERDAM. THE COFFERDAM LIMITS AND LOCATION
MAY BE ADJUSTED BY THE CONTRACTOR TO ACCOMMODATE THE CONTRACTOR'S MEANS AND METHODS
OF CONSTRUCTION. THE COFFERDAM SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF SECTIONS
503 AND 504, THE FOUNDATION NOTES AND ALL ENVIRONMENTAL PERMITS.
4. ALL COSTS ASSOCIATED WITH THE DESIGN, INSTALLATION, MAINTENANCE, AND REMOVAL OF
THE COFFERDAM WILL BE PAID FOR UNDER COFFERDAM ITEMS 503.201 AND 503.202. ALL
DEWATERING COSTS FOR THE INLET AND OUTLET HEADWALL AND WINGWALL EXCAVATIONS WILL
BE PAID UNDER ITEM 503.101.
5. COFFERDAMS THAT ARE CUT OFF AND LEFT IN PLACE AT THE CONTRACTOR'S CHOICE SHALL BE
CUT OFF A MINIMUM OF 3 FEET BELOW FINAL GRADE. NO ADDITIONAL PAYMENT WILL BE MADE
FOR COFFERDAMS THAT ARE CUTOFF AND LEFT IN PLACE.
6. ALL COSTS ASSOCIATED WITH THE RE-DESIGN AND RE-INSTALLATION OF COFFERDAMS DUE TO
SUBSURFACE CONDITIONS ENCOUNTERED DURING THE COFFERDAM INSTALLATION THAT ARE
DIFFERENT FROM WHAT THE COFFERDAM DESIGNER ASSUMED AND/OR INTERPRETED FROM THE
AVAILABLE SUBSURFACE INFORMATION SHALL BE SUBSIDIARY TO THE ASSOCIATED COFFERDAM
ITEM. SECTION 102.05 SHALL BE REFERENCED FOR ADDITIONAL INFORMATION REGARDING
THE USE OF SUBSURFACE INFORMATION PROVIDED IN THE CONTRACT.

WATER DIVERSION STRUCTURE NOTES

1. THE WATER DIVERSION STRUCTURE ITEM IS INCLUDED IN THE CONTRACT FOR THE PURPOSE OF
DIVERTING BOWMAN BROOK AND ANY SURFACE WATER FROM:

- INLET AND OUTLET HEADWALL EXCAVATIONS
- WINGWALL EXCAVATIONS
- PIPE LINER INSTALLATION

AND DEWATERING FROM:

- INLET AND OUTLET HEADWALL EXCAVATIONS
- WINGWALL EXCAVATIONS
- PIPE LINER INSTALLATION

THIS SINGLE ITEM SHALL BE USED FOR BOTH THE INLET AND OUTLET LOCATIONS WITH A CONTRACT
QUANTITY OF ONE UNIT. ALL COSTS ASSOCIATED WITH THE DESIGN, INSTALLATION, DEWATERING,
MAINTENANCE, EARTH DIKES, TEMPORARY PIPES, STEEL SHEETING, PUMPING, TREATMENT OF PUMPED
WATER, AND ALL OTHER MEASURES SELECTED BY THE CONTRACTOR TO COMPLETE THE WORK AND
REMOVAL OF THE WATER DIVERSION WILL BE PAID FOR UNDER WATER DIVERSION STRUCTURE ITEM
503.101. THE CONTRACTOR SHALL SUBMIT A WATER DIVERSION PLAN IN ACCORDANCE WITH 503.3.1.2.
THE SUBMITTAL SHALL INCLUDE THE PROPOSED METHOD OF DEWATERING AND THE METHOD OF DISPOSAL
OF WATER PUMPED FROM THE EXCAVATIONS.
2. THE WATER DIVERSION SHALL BE DESIGNED TO ACCOMMODATE THE BOTTOM OF EXCAVATION GRADE
INDICATED ON THE PLANS INCLUDING ANY AREAS WHERE THE ROCK EXCAVATION EXTENDS BELOW
THE REQUIRED ELEVATION. SEE FOUNDATION NOTES FOR ADDITIONAL INFORMATION.
3. THE WATER DIVERSION STRUCTURE SHALL BE DESIGNED, CONSTRUCTED AND MAINTAINED IN A
MANNER THAT MEETS THE REQUIREMENTS OF SECTION 503, 504, THE FOUNDATION NOTES, AND
ALL APPLICABLE ENVIRONMENTAL REQUIREMENTS.
4. THE WATER LEVEL WITHIN THE HEADWALL AND WINGWALL EXCAVATIONS SHALL BE MAINTAINED
BELOW THE BOTTOM OF FOOTING GRADE, SO THE FOOTING CONCRETE CAN BE PLACED IN THE DRY.
DEWATERING SHALL BE CONTINUOUS UNTIL THE HEADWALLS AND WINGWALLS ARE BACKFILLED TO
THE ELEVATION OF THE SURROUNDING WATER TABLE.

UTILITY NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION
AND SIZE OF ALL EXISTING UTILITIES, SHOWN AND NOT SHOWN, PRIOR TO CONSTRUCTION.
THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING
WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION SHALL BE TAKEN
BEFORE PROCEEDING WITH THE WORK.
2. THE CONTRACTOR SHALL NOTIFY DIG-SAFE PRIOR TO CONSTRUCTION.
3. THE EXISTING 6" HDPE SEWER FORCE MAIN TO THE WEST (INLET SIDE) OF NH 114 SHALL BE
PROTECTED THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING
THE LOCATION OF THE MAIN AND SHALL PROTECT AND USE EXTREME CARE WHILE MOVING
EQUIPMENT AND MATERIALS OVER IT. A MINIMUM OF 4' OF COVER OVER THE PIPE SHALL BE
MAINTAINED AT ALL TIMES.

SUMMARY OF BRIDGE QUANTITIES - BR. NO. 151/151			
ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT
209.201	GRANULAR BACKFILL (BRIDGE) (F)	380	CY
500.0201	ACCESS FOR BRIDGE CONSTRUCTION	1	U
500.0202	ACCESS FOR BRIDGE CONSTRUCTION	1	U
503.101	WATER DIVERSION STRUCTURE	1	U
503.201	COFFERDAMS	1	U
503.202	COFFERDAMS	1	U
504.1	COMMON BRIDGE EXCAVATION (F)	366	CY
504.2	ROCK BRIDGE EXCAVATION	273	CY
508.	STRUCTURAL FILL	105	CY
520.12	CONCRETE CLASS A, ABOVE FOOTINGS (F)	38	CY
520.213	CONCRETE CLASS B, FOOTINGS (ON SOIL) (F)	66	CY
520.32	GROUTING VOIDS IN BACKFILL MATERIAL	10	CY
534.3	WATER REPELLENT (SILANE/SILOXANE)	5	GAL
538.2	BARRIER MEMBRANE, PEEL AND STICK - VERTICAL SURFACES (F)	10	SY
541.4	PVC WATERSTOPS, NH TYPE 4 (F)	44	LF
544.	REINFORCING STEEL (F)	14567	LB
562.1	SILICONE JOINT SEALANT (F)	53	LF
1002.1	REPAIRS OR REPLACEMENTS AS NEEDED - BRIDGE STRUCTURES	*	\$

* NOT A BID ITEM

FOUNDATION NOTES

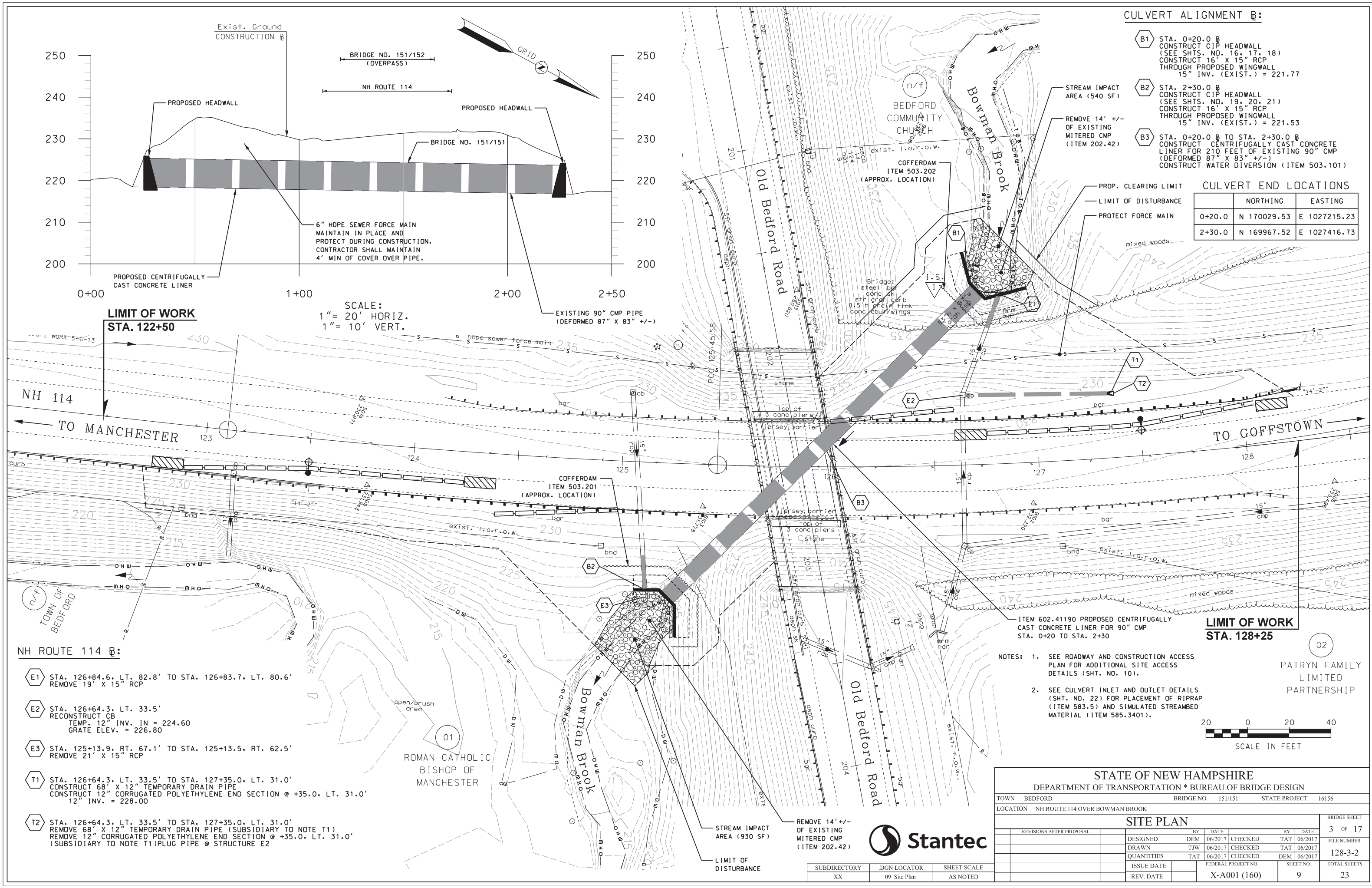
1. ALL FOOTINGS SHALL BE FOUNDED ON A MINIMUM 12 INCH THICK LAYER OF STRUCTURAL FILL.
PLACED OVER THE ACCEPTABLE BEARING MATERIALS DESCRIBED BELOW. THE CONTRACTOR MAY
SUBSTITUTE UP TO 12 INCHES OF CLEAN STONE STRUCTURAL FILL FOR THE CRUSHED GRAVEL
STRUCTURAL FILL IN ACCORDANCE WITH 508.2.1.3 AT NO COST TO THE DEPARTMENT.
2. THE EXISTING MISCELLANEOUS FILL, THE NATURAL GLACIAL OUTWASH DEPOSIT, AND BEDROCK
INCLUDING ANY WEATHERED AND FRACTURED BEDROCK ARE ACCEPTABLE FOR SUPPORT OF THE
PROPOSED FOOTINGS FOR THE INLET AND OUTLET HEADWALLS AND WINGWALLS. EXCAVATION OF
THESE MATERIALS BELOW THE SPECIFIED STRUCTURAL FILL THICKNESS IS NOT REQUIRED. ANY
TOPSOIL, WOOD, OR OTHER UNSUITABLE MATERIALS ENCOUNTERED BELOW THE PROPOSED BOTTOM
OF STRUCTURAL FILL GRADE SHALL BE EXCAVATED AND REPLACED WITH STRUCTURAL FILL, AS
DIRECTED.
3. THE EXCAVATION TO FINAL GRADE AND THE CONTROL OF WATER SHALL BE CONDUCTED IN
ACCORDANCE WITH SECTIONS 503 AND 504, AND IN A MANNER THAT PREVENTS DISTURBANCE OF
THE FOUNDATION SUPPORT MATERIALS. PUMPING EQUIPMENT SHALL BE PROPERLY FILTERED TO
PREVENT LOSS OF FINES. ANY DISTURBED AREAS SHALL BE OVER-EXCAVATED AND REPLACED
WITH STRUCTURAL FILL AT THE CONTRACTOR'S EXPENSE. SUMP AREAS SHALL BE LOCATED
OUTSIDE A 1H:2V SUPPORT LIMIT BELOW THE ABUTMENT AND WINGWALL FOOTINGS.
4. FOR LOCATIONS REQUIRING ROCK REMOVAL, THE REQUIRED ELEVATION FOR ROCK REMOVAL
SHALL BE 12 INCHES BELOW THE FOOTING TO ACCOMMODATE THE 12 INCHES OF STRUCTURAL FILL.
ANY ROCK REMOVED BELOW AN ELEVATION ONE FOOT LOWER THAN THE REQUIRED ELEVATION WILL BE
CONSIDERED AS EXCESS REMOVAL AND WILL NOT BE PAID. NO PAYMENT WILL BE MADE FOR
STRUCTURAL FILL THAT IS REQUIRED TO REPLACE EXCESS ROCK REMOVAL.
5. FRACTURES OR SEAMS IN THE BEDROCK SURFACE EXPOSED AT THE BOTTOM OF THE FOUNDATION
EXCAVATION SHALL BE CLEANED AND GROUTED IN ACCORDANCE WITH 504.3.2, OR CHINKED WITH
CLEAN STONE FOR STRUCTURAL FILL AS DIRECTED.
6. PROTRUDING COBBLES AND BOULDERS ENCOUNTERED AT THE FINAL EXCAVATION LEVEL SHOULD
BE EITHER REMOVED AND REPLACED WITH STRUCTURAL FILL OR SPLIT TO PROVIDE A LEVEL
SURFACE.

PIPE LINING NOTES

1. THE WORK SHALL CONSIST OF THE REPAIR OF THE CULVERT BY THE INSTALLATION OF A
CEMENTITIOUS LINING CENTRIFUGALLY CAST IN PLACE FOR THE WATERPROOFING, SEALING,
STRUCTURAL REINFORCEMENT AND CORROSION PROTECTION OF EXISTING CORRUGATED STEEL
CULVERT PIPE. THE CENTRIFUGALLY CAST CONCRETE LINER SHALL EXTEND OVER THE
SPECIFIED LENGTH FORMING A CONTINUOUS CONCRETE PIPE WITHIN A PIPE.
2. FOR ITEM 602.41190 CENTRIFUGALLY CAST CONCRETE LINER FOR 90" CMP, THE APPLICATION
THICKNESS SHALL BE A MINIMUM OF 2", UNLESS THE STRUCTURAL CALCULATIONS SHOW A NEED
FOR EVEN GREATER THICKNESS. SEE SPECIAL PROVISIONS FOR DETAILED REQUIREMENTS.
3. USE ITEM 520.32 TO GROUT ANY VOIDS FOUND IN THE BACKFILL MATERIAL SURROUNDING THE
EXISTING CULVERT PRIOR TO INSTALLING THE CONCRETE LINER. SEE SPECIAL PROVISIONS
FOR DETAILED REQUIREMENTS.



SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE							
BRC\BrSite	08_BRIDGE_NOTES	AS NOTED							



CULVERT ALIGNMENT @:

- B1 STA. 0+20.0 @
CONSTRUCT CIP HEADWALL
(SEE SHTS. NO. 16, 17, 18)
CONSTRUCT 16" X 15" RCP
THROUGH PROPOSED WINGWALL
15" INV. (EXIST.) = 221.77
- B2 STA. 2+30.0 @
CONSTRUCT CIP HEADWALL
(SEE SHTS. NO. 19, 20, 21)
CONSTRUCT 16" X 15" RCP
THROUGH PROPOSED WINGWALL
15" INV. (EXIST.) = 221.53
- B3 STA. 0+20.0 @ TO STA. 2+30.0 @
CONSTRUCT CENTRIFUGALLY CAST CONCRETE
LINER FOR 210 FEET OF EXISTING 90" CMP
(DEFORMED 87" X 83" +/-)
CONSTRUCT WATER DIVERSION (ITEM 503.101)

CULVERT END LOCATIONS

	NORTHING	EASTING
0+20.0	N 170029.53	E 1027215.23
2+30.0	N 169967.52	E 1027416.73

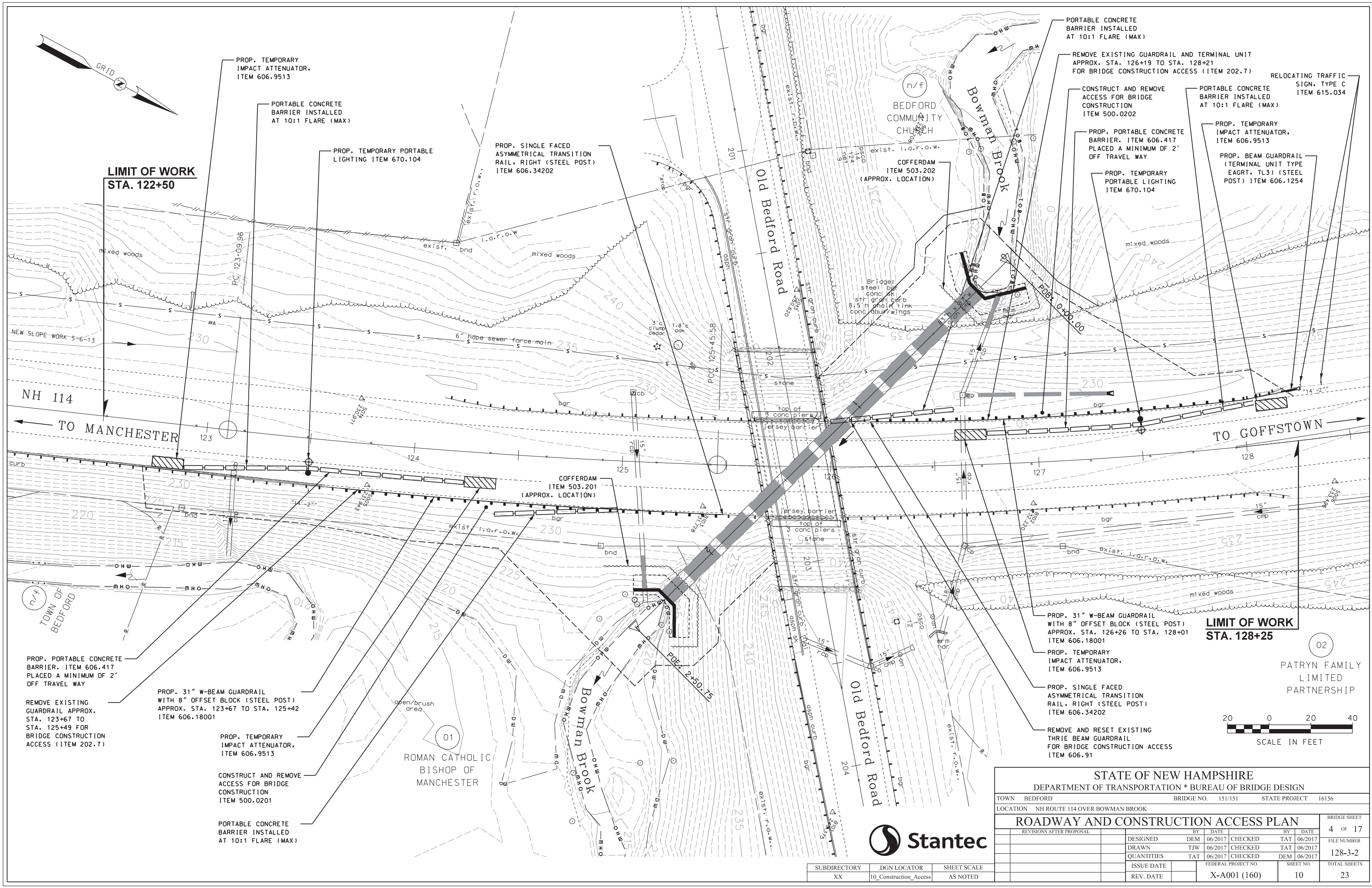
- NOTES: 1. SEE ROADWAY AND CONSTRUCTION ACCESS
PLAN FOR ADDITIONAL SITE ACCESS
DETAILS (SHT. NO. 10).
2. SEE CULVERT INLET AND OUTLET DETAILS
(SHT. NO. 22) FOR PLACEMENT OF RIPRAP
(ITEM 583.5) AND SIMULATED STREAMBED
MATERIAL (ITEM 585.3401).



STATE OF NEW HAMPSHIRE											
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN											
TOWN	BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156		
LOCATION NH ROUTE 114 OVER BOWMAN BROOK											
SITE PLAN										BRIDGE SHEET	
	REVISIONS AFTER PROPOSAL				BY	DATE		BY	DATE	3 OF 17	
				DESIGNED	DEM	06/2017	CHECKED	TAT	06/2017	FILE NUMBER	
				DRAWN	TJW	06/2017	CHECKED	TAT	06/2017	128-3-2	
				QUANTITIES	TAT	06/2017	CHECKED	DEM	06/2017	TOTAL SHEETS	
				ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.			
				REV. DATE		X-A001 (160)		9		23	

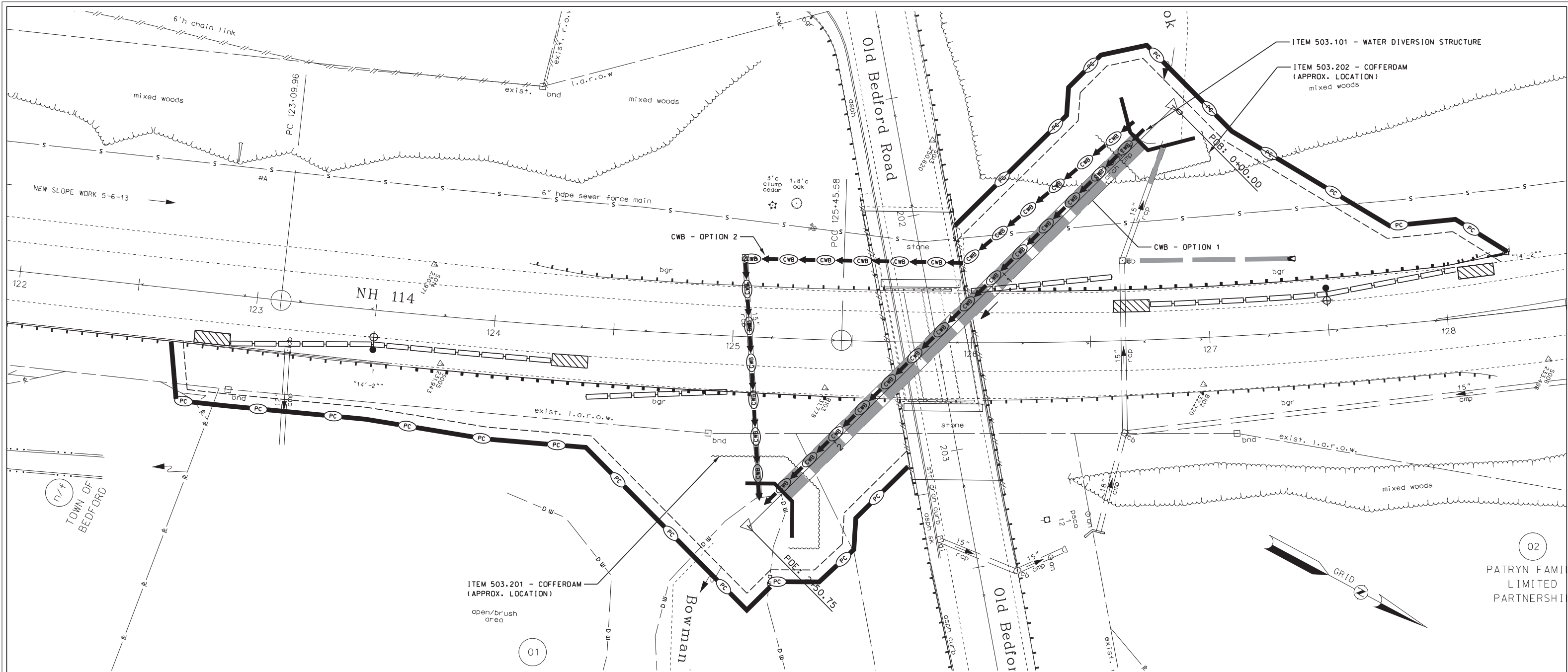


SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	09_Site Plan	AS NOTED



STATE OF NEW HAMPSHIRE												
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN												
TOWN		BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156		
LOCATION		NH ROUTE 114 OVER BOWMAN BROOK										
ROADWAY AND CONSTRUCTION ACCESS PLAN										BRIDGE SHEET		
REVISIONS AFTER PROPOSAL				BY	DATE	CHECKED	TAT	DATE	4 OF 17			
			DESIGNED	DEM	06/2017	CHECKED	TAT	06/2017	FILE NUMBER			
			DRAWN	TJW	06/2017	CHECKED	TAT	06/2017	128-3-2			
			QUANTITIES	TAT	06/2017	CHECKED	DEM	06/2017				
			ISSUE DATE	FEDERAL PROJECT NO.				SHEET NO.		TOTAL SHEETS		
			REV. DATE		X-A001 (160)				10		23	

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	10_Construction_Access	AS NOTED



EROSION CONTROL PLAN LEGEND

	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	CLEAN WATER BYPASS PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

NOTES:

- CULVERT REHABILITATION SHALL BE DONE DURING LOW FLOW PERIODS.
- INSTALL PERIMETER CONTROLS ALONG PERIMETER OF DISTURBED AREA.
- INSTALL WATER DIVERSION STRUCTURE.
- THE CONTRACTOR SHALL PROVIDE FOR SUMPS AND WELL POINTS WITH TEMPORARY PUMPING AS REQUIRED TO INSTALL THE HEADWALLS AND PIPE LINING. THE CONTRACTOR SHALL PUMP TO SEDIMENT CONTROL BASINS, SEDIMENT BAGS, OR SIMILAR MEASURES DURING DEWATERING OPERATIONS.
- REMOVE UPSTREAM AND DOWNSTREAM MITERED PORTIONS OF EXISTING CMP.
- INSTALL HEADWALLS AT RELOCATED INLET AND OUTLET.
- REHABILITATE PIPE.
- GRADE AND CONSTRUCT UPSTREAM AND DOWNSTREAM STONE APRONS.
- DIRECT FLOW THROUGH NEWLY LINED PIPE.
- ALL DEWATERING ASSOCIATED WITH CONSTRUCTION OF THE RETAINING WALLS AND REHABILITATION OF THE CULVERT SHALL BE SUBSIDIARY TO ITEM 503.101.

NOTE:

THIS SHEET PROVIDES A TYPICAL CONSTRUCTION DEWATERING AND FLOW CONTROL PLAN. THE CONTRACTOR SHALL SUBMIT DRAWINGS AND DETAILS SHOWING MATERIALS TO BE USED, PROPOSED METHOD OF CONSTRUCTION, AND OTHER DETAILS LEFT OPEN TO CHOICE OR NOT FULLY SHOWN ON THE PLANS. DRAWINGS SHALL BE SUBMITTED FOR DOCUMENTATION IN ACCORDANCE WITH SECTION 105.02 OF THE NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN.



STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN	BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156	
LOCATION NH ROUTE 114 OVER BOWMAN BROOK										
WATER DIVERSION PLAN								BRIDGE SHEET		
REVISIONS AFTER PROPOSAL			BY		DATE		BY		DATE	
			DESIGNED		DEM 06/2017		CHECKED		TAT 06/2017	
			DRAWN		TJW 06/2017		CHECKED		TAT 06/2017	
			QUANTITIES		TAT 06/2017		CHECKED		DEM 06/2017	
			ISSUE DATE		FEDERAL PROJECT NO.				SHEET NO.	
			REV. DATE		X-A001 (160)				11	
								5 OF 17		
								FILE NUMBER		
								128-3-2		
								TOTAL SHEETS		
								23		



SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	11_WDiv_Plan	AS NOTED

BORING NO. B01

TEST BORING REPORT										BORING NO. B01	
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION										SHEET NO. 1 OF 1	
PROJECT NAME BEDFORD 16156										STA. OFF.	
DESCRIPTION Culvert Replacement NH 114										BRIDGE NO. N/A	
GROUNDWATER										EQUIPMENT	
DATE 2/8/11										TYPE: S	
TIME 12:30 pm										SIZE ID. (in): 1.375	
DEPTH 11.4										NW NX	
ELEV. 218.5										3 1.875	
BOTTOM OF CASING 10.0										HAMMER WT. (lb): 140	
BOTTOM OF HOLE 19.6										HAMMER FALL (in): 30	
SAMPLE NUMBER										DRILL RIG	
SAMPLER RECOVERY (ft) [%]										CME 45-C Track rig	
DEPTH RANGE (ft)										HAMMER TYPE: Automatic	
FIELD CLASSIFICATION AND REMARKS											
0 0.4 229.5 2 3 2 4 S1 (SW) 1.4 [70] 2.0 Dark brown, loamy TOPSOIL, frequent root fibers, frozen to 0.3' Loose, olive brown to yellowish brown, FINE SAND, trace fine gravel, trace coarse sand, trace medium sand, trace silt -FILL-											
3.5 226.4 14 11 7 5 S2 (SM) 0.7 [35] 6.0 Wash color turned from yellowish brown to olive brown at 3.5' Medium dense, light olive brown, silty FINE SAND, trace fine gravel, trace coarse sand, trace medium sand, occasional thin layers olive brown, MEDIUM SAND, particles rounded to well rounded											
5 8.4 221.5 -GLACIAL OUTWASH-											
-APPROXIMATE BEDROCK SURFACE-											
10 Advanced boring with roller bit through very severely weathered bedrock from 8.4' to 10.0'											
15 C1 3.8 [79] 14.8 Very hard, moderately weathered, moderately fractured, grey with brown, coarse grained, GRANITE. High angle fractures at 11.5' and 12.4'. Other fractures shallow to moderately dipping. Strong oxidation staining present throughout sample RQD: 2.8 / 4.8 = 58%											
20 C2 4.8 [100] 19.6 Very hard, moderately weathered, moderately fractured, grey with brown, coarse grained, GRANITE. Fractures shallow to moderately dipping. Strong oxidation staining throughout sample RQD: 1.9 / 4.8 = 40%											
25 Bottom of Exploration @ 19.6 ft (El. 210.3)											
SAMPLER IDENTIFICATION											
S Standard Split Spoon											
SL Large Spoon (O.D. = 3 in)											
T Thin Wall Tube											
U Undisturbed Piston											
O Open End Rod											
A Auger Flight											
C Core Barrel											
NR Not Recorded											
COHESIVE SOILS											
Blows/foot											
Consistency											
NON-COHESIVE SOILS											
Blows/foot											
Density											
Soil Descriptions											
Capitalized Soil Name											
Lower Case Adjective											
Some											
Little											
Trace											
Proportion											
Major Component											
35% - 50%											
20% - 35%											
10% - 20%											
1% - 10%											
WOR - Weight of Rod											
WOH - Weight of Hammer											
ENGLISH											

BORING NO. B02

TEST BORING REPORT										BORING NO. B02	
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION										SHEET NO. 1 OF 2	
PROJECT NAME BEDFORD 16156										STA. OFF.	
DESCRIPTION Culvert Replacement NH 114										BRIDGE NO. N/A	
GROUNDWATER										EQUIPMENT	
DATE 2/14/11										TYPE: S	
TIME 1:00 pm										SIZE ID. (in): 1.375	
DEPTH 25.2										NW BW44	
ELEV. 224.9										3 1.755	
BOTTOM OF CASING 31.1										HAMMER WT. (lb): 140	
BOTTOM OF HOLE 35.9										HAMMER FALL (in): 30	
SAMPLE NUMBER										DRILL RIG	
SAMPLER RECOVERY (ft) [%]										CME 45-C Track rig	
DEPTH RANGE (ft)										HAMMER TYPE: Automatic	
FIELD CLASSIFICATION AND REMARKS											
0 0.4 249.7 Black, ASPHALT PAVEMENT											
50 37 19 12 S1 (SW) 1.6 [80] 3.0 Very dense, olive yellow, FINE SAND, trace coarse-fine gravel, trace coarse sand, trace medium sand, trace silt											
5 6 4 4 S2 (SP) 0.9 [45] 7.0 -FILL- Loose, olive yellow, FINE SAND, trace silt											
10 6 7 5 S3 (SP) 1.0 [50] 12.0 Medium dense, olive yellow, FINE SAND, trace medium sand, trace silt											
15 14.5 235.6 5 4 14 17 S4 (ML) 1.2 [60] 17.0 Wash color change from olive yellow to olive at 14.5' Medium dense, olive, SILT, trace gravel, trace coarse sand, trace medium sand, trace fine sand, occasional thin layers dark grey SILT, particles sub rounded to well rounded											
20 6 8 8 6 S5 (SM) 1.1 [55] 22.0 -GLACIAL OUTWASH- Medium dense, olive, silty FINE SAND, trace fine gravel, trace coarse sand, trace medium sand, occasional thin layers olive grey SILT, occasional dark yellowish brown mottles, particles rounded to well rounded											
25 8 8 5 7 S6 (SP-SM) 1.0 [50] 25.0 Medium dense, olive, FINE SAND, little silt, trace medium sand, frequent layering											
SAMPLER IDENTIFICATION											
S Standard Split Spoon											
SL Large Spoon (O.D. = 3 in)											
T Thin Wall Tube											
U Undisturbed Piston											
O Open End Rod											
A Auger Flight											
C Core Barrel											
NR Not Recorded											
COHESIVE SOILS											
Blows/foot											
Consistency											
NON-COHESIVE SOILS											
Blows/foot											
Density											
Soil Descriptions											
Capitalized Soil Name											
Lower Case Adjective											
Some											
Little											
Trace											
Proportion											
Major Component											
35% - 50%											
20% - 35%											
10% - 20%											
1% - 10%											
WOR - Weight of Rod											
WOH - Weight of Hammer											
ENGLISH											

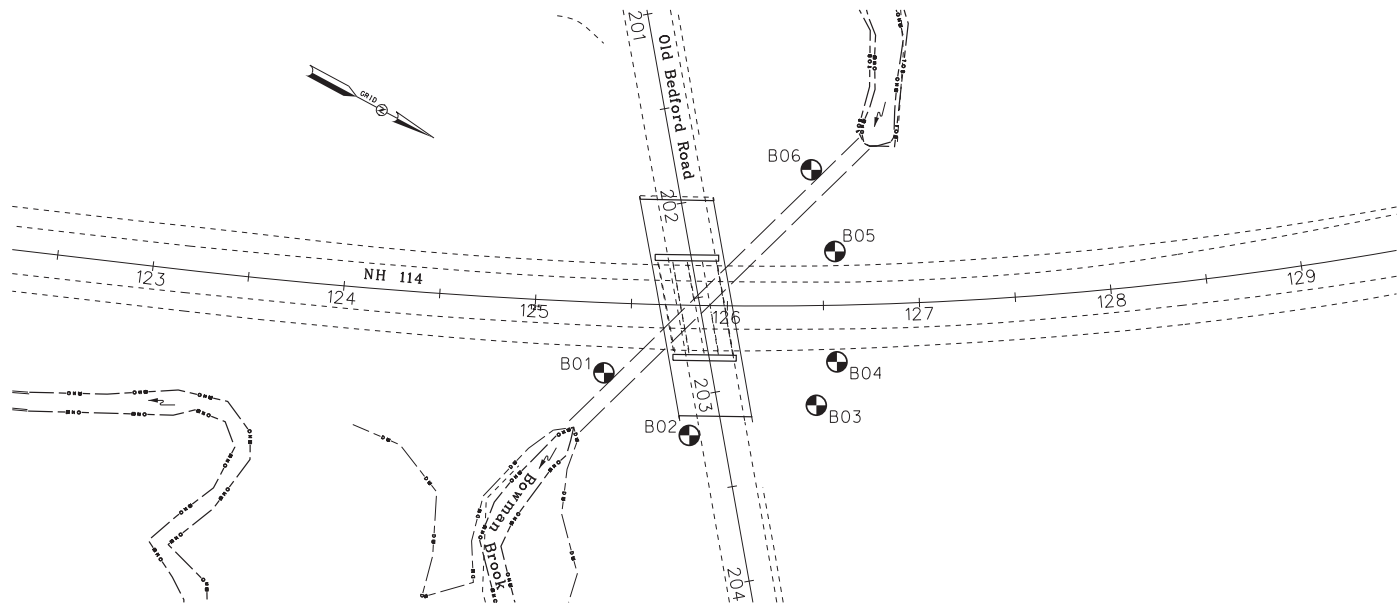
BORING NO. B02

(CONTINUED)

TEST BORING REPORT										BORING NO. B02	
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION										SHEET NO. 2 OF 2	
PROJECT NAME BEDFORD 16156										STA. OFF.	
DESCRIPTION Culvert Replacement NH 114										BRIDGE NO. N/A	
GROUNDWATER										EQUIPMENT	
DATE 2/14/11										TYPE: S	
TIME 1:00 pm										SIZE ID. (in): 1.375	
DEPTH 31.1										NW BW44	
ELEV. 219.0										3 1.755	
BOTTOM OF CASING 31.1										HAMMER WT. (lb): 140	
BOTTOM OF HOLE 35.9										HAMMER FALL (in): 30	
SAMPLE NUMBER										DRILL RIG	
SAMPLER RECOVERY (ft) [%]										CME 45-C Track rig	
DEPTH RANGE (ft)										HAMMER TYPE: Automatic	
FIELD CLASSIFICATION AND REMARKS											
30 31.1 219.0 4 14 17/0.1 S7 0.7 [64] 30.0 -GLACIAL OUTWASH- Olive, FINE SAND, trace medium sand, trace silt, very severely weathered rock fragments in spoon shoe											
35 C1 4.8 [100] 31.1 -APPROXIMATE BEDROCK SURFACE- Very hard, moderately weathered, extremely fractured, grey with brown, coarse grained, GRANITE from 31.1' to 32.6' then very hard, slightly weathered, moderately to extremely fractured, grey, fine grained, QUARTZITE from 32.6' to 35.9'. Fractures shallow to moderately dipping RQD: 1.1 / 4.8 = 23%											
Bottom of Exploration @ 35.9 ft (El. 214.2)											
SAMPLER IDENTIFICATION											
S Standard Split Spoon											
SL Large Spoon (O.D. = 3 in)											
T Thin Wall Tube											
U Undisturbed Piston											
O Open End Rod											
A Auger Flight											
C Core Barrel											
NR Not Recorded											
COHESIVE SOILS											
Blows/foot											
Consistency											
NON-COHESIVE SOILS											
Blows/foot											
Density											
Soil Descriptions											
Capitalized Soil Name											
Lower Case Adjective											
Some											
Little											
Trace											
Proportion											
Major Component											
35% - 50%											
20% - 35%											
10% - 20%											
1% - 10%											
WOR - Weight of Rod											
WOH - Weight of Hammer											
ENGLISH											

BORING NOTES:

- FOR BORINGS B01 THROUGH B06, THE NHDOT PERFORMED SUBSURFACE INVESTIGATIONS AT THE SITE IN FEBRUARY 2011. ADDITIONAL BORING LOGS AND GEOTECHNICAL INFORMATION IS AVAILABLE ON-LINE ON THE INVITATION TO BID WEBPAGE AT WWW.NH.GOV/DOT IN THE SPECIFIC PROJECT'S PROPOSAL PACKAGE. ADDITIONAL BORINGS FROM THE 1964 STATE PROJECT P4988 ARE SHOWN ON BRIDGE SHEET 9.
- NORTHING AND EASTING COORDINATES REFERENCE THE NORTH AMERICAN DATUM 1983/ 1986 AND ELEVATIONS REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.
- SUBSURFACE CONDITIONS ARE KNOWN ONLY AT THE EXPLORATION LOCATIONS AND COULD VARY AT OTHER LOCATIONS ON THE SITE.
- GROUNDWATER LEVELS SHOWN ON THE LOGS REPRESENT THE CONDITIONS AT THE TIMES OF MEASUREMENT AND COULD CHANGE IN RESPONSE TO SEVERAL FACTORS INCLUDING PRECIPITATION AND TERRAIN ALTERATION.




BORING PLAN
SCALE: 1"=20'-0"




SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	12_BoringLog 01	AS NOTED

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN BEDFORD		BRIDGE NO. 151/151		STATE PROJECT 16156					
LOCATION NH ROUTE 114 OVER BOWMAN BROOK									
BORING LOGS (SHEET 1 OF 4)								BRIDGE SHEET	
								6 OF 17	
								FILE NUMBER	
								128-3-2	
								TOTAL SHEETS	
								23	

BORING NO. B03

TEST BORING REPORT												BORING NO. B03	
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION												SHEET NO. 1 OF 1	
PROJECT NAME BEDFORD 16156										BRIDGE NO. N/A		STA. OFF.	
DESCRIPTION Culvert Replacement NH 114												BASELINE NH Route 114	
GROUNDWATER										EQUIPMENT		SAMPLER CASING CORE	
DATE	TIME	DEPTH (ft)	ELEV. (ft)	BOTTOM OF CASING (ft)	BOTTOM OF HOLE (ft)	TYPE	SIZE I.D. (in)	S	NW	NX			
2/7/11	9:00 am	13.4	227.3	15.5	20.8			1.375	3	1.875			
										HAMMER W.T. (lb): 140		DRILL RIG	
										HAMMER FALL (in): 30		CME 45-C Track rig	
										HAMMER TYPE: Automatic			
DEPTH (ft)	STRATUM CHANGE (ft) DEPTH ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS						STRATUM SYMBOL	
0		2	1 4	S1 (SM)	1.2 [60]	Loose, light yellowish brown, silty FINE SAND, trace root fibers, frozen to 0.2'							
	3.0	237.7	4		2.0	-FILL-							
						Wash color changed from yellowish brown to olive brown at 3.0'							
5			7 12 14	S2 (ML)	2.0 [100]	Dense, light olive brown, fine sandy SILT, trace medium sand, frequent layering							
			13		6.0	-GLACIAL OUTWASH-							
			75/0.4	S3	0.1 [25]	Olive yellow, severely weathered, ROCK FRAGMENTS							
10					9.0	Advanced boring with roller bit through cobble from 9.4' to 9.7'							
15	14.5	226.2	17 24 70	S4	1.2 [80]	Dark yellowish brown, FINE SAND, trace medium sand, trace silt							
					15.5	-APPROXIMATE BEDROCK SURFACE-							
					16.0	Dark yellowish brown, very severely weathered, ROCK FRAGMENTS							
				C1	4.8 [100]	Very hard, moderately weathered, moderately fractured, grey, fine grained, QUARTZITE. Coarse grained GRANITE from 18.0' to 20.1'. Fractures shallow to moderately dipping. Oxidation staining on fracture surfaces from 16.0' to 18.0' and from 20.1' to 20.8'							
20					20.8	Bottom of Exploration @ 20.3 ft (El. 219.9)							
25													
Sampler Identification		COHESIVE SOILS		NON-COHESIVE SOILS		Soil Descriptions		Proportion					
S Standard Split Spoon		Blows/foot		Blows/foot		Capitalized Soil Name		Major Component					
SL Large Spoon (O.D.= 3 in)		0 - 1 Very Soft		0 - 4 Very Loose		Lower Case Adjective		35% - 50%					
T Thin Wall Tube		2 - 4 Soft		5 - 10 Loose		Some		20% - 35%					
U Undisturbed Piston		5 - 8 Medium Stiff		11 - 24 Medium Dense		Little		10% - 20%					
O Open End Rod		9 - 15 Stiff		25 - 50 Dense		Trace		1% - 10%					
A Auger Flight		16 - 30 Very Stiff		> 50 Very Dense									
C Core Barrel		31 - 60 Hard		WOR - Weight of Rod									
NR Not Recorded		> 60 Very Hard		WOH - Weight of Hammer									
ENGLISH													

BORING NO. B04

TEST BORING REPORT												BORING NO. B04	
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION												SHEET NO. 1 OF 1	
PROJECT NAME BEDFORD 16156										BRIDGE NO. N/A		STA. OFF.	
DESCRIPTION Culvert Replacement NH 114												BASELINE NH Route 114	
GROUNDWATER										EQUIPMENT		SAMPLER CASING CORE	
DATE	TIME	DEPTH (ft)	ELEV. (ft)	BOTTOM OF CASING (ft)	BOTTOM OF HOLE (ft)	TYPE	SIZE I.D. (in)	S	NW	NX			
2/9/11	11:00 am	6.5	223.7	4.0	8.8			1.375	3	1.875			
2/9/11	12:00 pm	6.6	223.6	4.0	8.8			1.375	3	1.875			
										HAMMER W.T. (lb): 140		DRILL RIG	
										HAMMER FALL (in): 30		CME 45-C Track rig	
										HAMMER TYPE: Automatic			
DEPTH (ft)	STRATUM CHANGE (ft) DEPTH ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS						STRATUM SYMBOL	
0		1 4 8 12	S1 (SW-SM)	1.3 [65]	0.0	Dark brown, loamy TOPSOIL, frequent root fibers, frozen to 0.3'							
	0.4	229.8			2.0	Medium dense, yellowish brown, FINE SAND, some coarse-fine gravel, little silt, trace coarse sand, trace medium sand							
						-FILL-							
	3.3	226.9				-APPROXIMATE BEDROCK SURFACE-							
						Advanced boring with roller bit through very severely weathered bedrock from 3.3' to 4.0'							
5				C1	4.8 [100]	Very hard, moderately weathered, moderately fractured, grey with brown, coarse grained, GRANITE. Fine grained QUARTZITE from 7.9' to 8.8'. Vertical fracture from 7.5' to 7.9'. Other fractures shallow to moderately dipping. Oxidation staining present on all fracture surfaces							
					8.8	Bottom of Exploration @ 8.8 ft (El. 221.4)							
10													
15													
20													
25													
Sampler Identification		COHESIVE SOILS		NON-COHESIVE SOILS		Soil Descriptions		Proportion					
S Standard Split Spoon		Blows/foot		Blows/foot		Capitalized Soil Name		Major Component					
SL Large Spoon (O.D.= 3 in)		0 - 1 Very Soft		0 - 4 Very Loose		Lower Case Adjective		35% - 50%					
T Thin Wall Tube		2 - 4 Soft		5 - 10 Loose		Some		20% - 35%					
U Undisturbed Piston		5 - 8 Medium Stiff		11 - 24 Medium Dense		Little		10% - 20%					
O Open End Rod		9 - 15 Stiff		25 - 50 Dense		Trace		1% - 10%					
A Auger Flight		16 - 30 Very Stiff		> 50 Very Dense									
C Core Barrel		31 - 60 Hard		WOR - Weight of Rod									
NR Not Recorded		> 60 Very Hard		WOH - Weight of Hammer									
ENGLISH													



SUBDIRECTORY	DGN LOCATOR	SHEET SCALE	REVISIONS AFTER PROPOSAL		BY	DATE	BY	DATE	BRIDGE SHEET
XX	13_BoringLog 02	AS NOTED			DESIGNED	DEM	CHECKED	TAT	7 OF 17
					DRAWN	TJW	CHECKED	TAT	FILE NUMBER
					QUANTITIES	TAT	CHECKED	DEM	128-3-2
					ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
					REV. DATE		X-A001 (160)	13	23

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD	BRIDGE NO.	151/151	STATE PROJECT	16156				
LOCATION NH ROUTE 114 OVER BOWMAN BROOK									
BORING LOGS (SHEET 2 OF 4)									BRIDGE SHEET
									7 OF 17
									FILE NUMBER
									128-3-2
									TOTAL SHEETS
									23

BORING NO. B05

TEST BORING REPORT										BORING NO. B05		
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION										SHEET NO. 1 OF 1		
PROJECT NAME BEDFORD 16156 BRIDGE NO. N/A										STA. OFF.		
DESCRIPTION Culvert Replacement NH 114										BASELINE NH Route 114		
GROUNDWATER					EQUIPMENT		SAMPLER		CASING		CORE	
DATE	TIME	DEPTH (ft)	ELEV. (ft)	BOTTOM OF CASING (ft)	BOTTOM OF HOLE (ft)	TYPE	S	NW	NX			
2/11/11	11:30 am	4.3	222.8	2.5	7.8	HAMMER W.T. (lb):	1375	3	1875			
						HAMMER FALL (in):	140	DRILL RIG				
						HAMMER TYPE:	Automatic	CME 45-C Track rig				
DEPTH (ft)	STRATUM CHANGE (ft) DEPTH ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS						STRATUM SYMBOL
0	0.4 226.7	1 2 14 7	S1 (SW)	1.3 [65]	0.0 2.0	Dark brown, loamy TOPSOIL, occasional root fragments, frozen to 0.3' Medium dense, yellowish brown, MEDIUM-FINE SAND, trace fine gravel, occasional very severely weathered rock fragments						
	2.5 224.6				3.0	-FILL- -APPROXIMATE BEDROCK SURFACE- Advanced boring with roller bit through very severely weathered bedrock from 2.5' to 3.0'						
5			C1	4.6 [96]	7.8	Very hard, moderately weathered, moderately to extremely fractured, grey, coarse grained, GRANITE. Fractures shallow to moderately dipping. Oxidation staining present on most fracture surfaces RQD: 2.4 / 4.8 = 50%						
						Bottom of Exploration @ 7.8 ft (El. 219.3)						
10												
15												
20												
25												
Sampler Identification		COHESIVE SOILS		NON-COHESIVE SOILS		Soil Descriptions		Proportion				
S Standard Split Spoon		Blows/foot		Blows/foot		Capitalized Soil Name		Major Component				
SL Large Spoon (O.D.= 3 in)		Consistency		Density		Lower Case Adjective		35% - 50%				
T Thin Wall Tube		0 - 1 Very Soft		0 - 4 Very Loose		Some		20% - 35%				
U Undisturbed Piston		2 - 4 Soft		5 - 10 Loose		Little		10% - 20%				
O Open End Rod		5 - 8 Medium Stiff		11 - 24 Medium Dense		Trace		1% - 10%				
A Auger Flight		9 - 15 Stiff		25 - 50 Dense								
C Core Barrel		16 - 30 Very Stiff		> 50 Very Dense								
NR Not Recorded		31 - 60 Hard		WOR - Weight of Rod		WOH - Weight of Hammer		ENGLISH				
		> 60 Very Hard										

BORING NO. B06

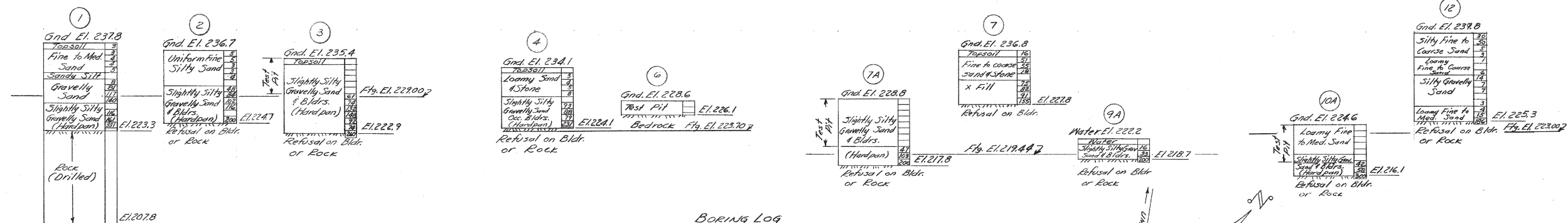
TEST BORING REPORT										BORING NO. B06		
STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION MATERIALS & RESEARCH BUREAU - GEOTECHNICAL SECTION										SHEET NO. 1 OF 1		
PROJECT NAME BEDFORD 16156 BRIDGE NO. N/A										STA. OFF.		
DESCRIPTION Culvert Replacement NH 114										BASELINE NH Route 114		
GROUNDWATER					EQUIPMENT		SAMPLER		CASING		CORE	
DATE	TIME	DEPTH (ft)	ELEV. (ft)	BOTTOM OF CASING (ft)	BOTTOM OF HOLE (ft)	TYPE	S	NW	NX			
2/10/11	12:30 pm	6.5	221.7	9.7	15.8	HAMMER W.T. (lb):	1375	3	1875			
						HAMMER FALL (in):	140	DRILL RIG				
						HAMMER TYPE:	Automatic	CME 45-C Track rig				
DEPTH (ft)	STRATUM CHANGE (ft) DEPTH ELEVATION	BLOWS PER 0.5 ft	SAMPLE NUMBER	SAMPLER RECOVERY (ft) [%]	DEPTH RANGE (ft)	FIELD CLASSIFICATION AND REMARKS						STRATUM SYMBOL
0					0.0	Medium dense, light olive brown, FINE SAND, little coarse-fine gravel, little silt, trace coarse sand, trace medium sand, occasional root fibers, frozen to 0.3'						
					2.0	-FILL- Wash color change from olive brown to olive -GLACIAL OUTWASH-						
5					4.0	Loose, olive, FNE SAND, little silt, occasional thin layers olive FINE SAND, trace silt, occasional thin layers olive SILT						
					6.0	Advanced boring with roller bit through cobble from 7.0' to 7.4'						
10	9.7	218.5			9.0	Olive, MEDIUM-FINE SAND, trace coarse sand, trace silt, severely weathered rock fragments in spoon shoe						
					11.0	-APPROXIMATE BEDROCK SURFACE- Advanced boring with roller bit through very severely weathered bedrock from 9.7' to 11.7'						
15					15.8	Very hard, moderately weathered, moderately fractured to sound, grey, medium to coarse grained, GRANITE. Fractures shallow to moderately dipping RQD: 2.4 / 4.8 = 50%						
						Bottom of Exploration @ 15.8 ft (El. 212.4)						
20												
25												
Sampler Identification		COHESIVE SOILS		NON-COHESIVE SOILS		Soil Descriptions		Proportion				
S Standard Split Spoon		Blows/foot		Blows/foot		Capitalized Soil Name		Major Component				
SL Large Spoon (O.D.= 3 in)		Consistency		Density		Lower Case Adjective		35% - 50%				
T Thin Wall Tube		0 - 1 Very Soft		0 - 4 Very Loose		Some		20% - 35%				
U Undisturbed Piston		2 - 4 Soft		5 - 10 Loose		Little		10% - 20%				
O Open End Rod		5 - 8 Medium Stiff		11 - 24 Medium Dense		Trace		1% - 10%				
A Auger Flight		9 - 15 Stiff		25 - 50 Dense								
C Core Barrel		16 - 30 Very Stiff		> 50 Very Dense		WOR - Weight of Rod		WOH - Weight of Hammer		ENGLISH		
NR Not Recorded		31 - 60 Hard										
		> 60 Very Hard										



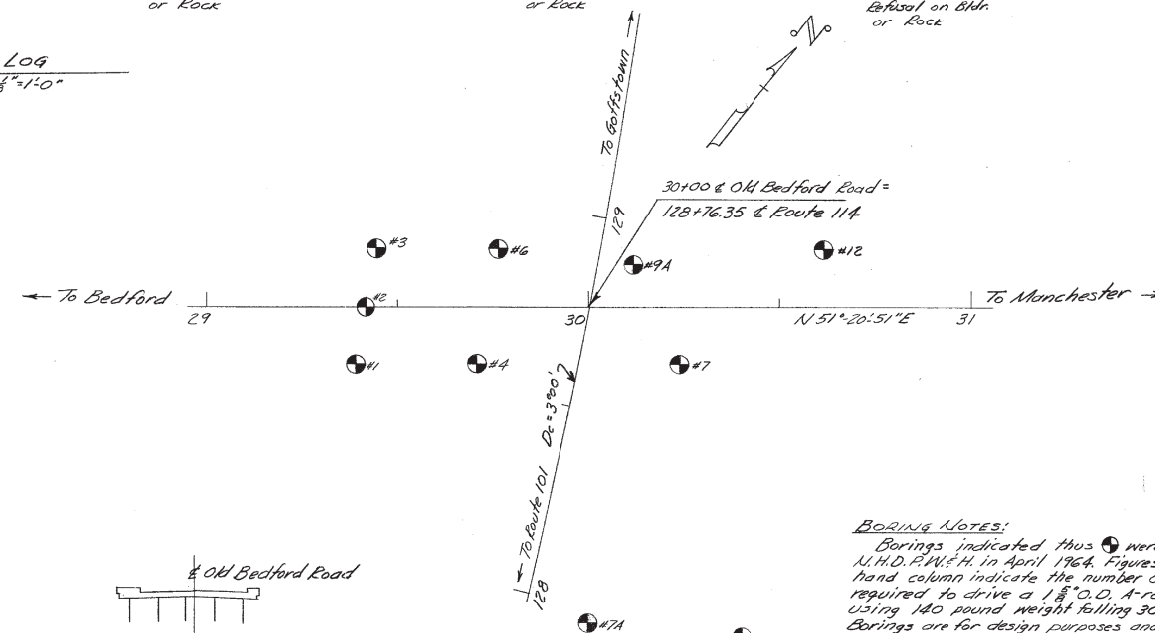
STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD	BRIDGE NO.	151/151	STATE PROJECT	16156				
LOCATION NH ROUTE 114 OVER BOWMAN BROOK									
BORING LOGS (SHEET 3 OF 4)						BRIDGE SHEET			
						8 OF 17			
REVISIONS AFTER PROPOSAL						BY DATE			
						DESIGNED DEM 06/2017			
						DRAWN TJW 06/2017			
						QUANTITIES TAT 06/2017			
						ISSUE DATE			
						REV. DATE			
						FEDERAL PROJECT NO.			
						SHEET NO.			
						TOTAL SHEETS			
						X-A001 (160)			
						14			
						23			

SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	14_BoringLog 03	AS NOTED

FED. ROAD DIST. NO.	STATE	PROJ.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	N.H.	523(9)		40	209

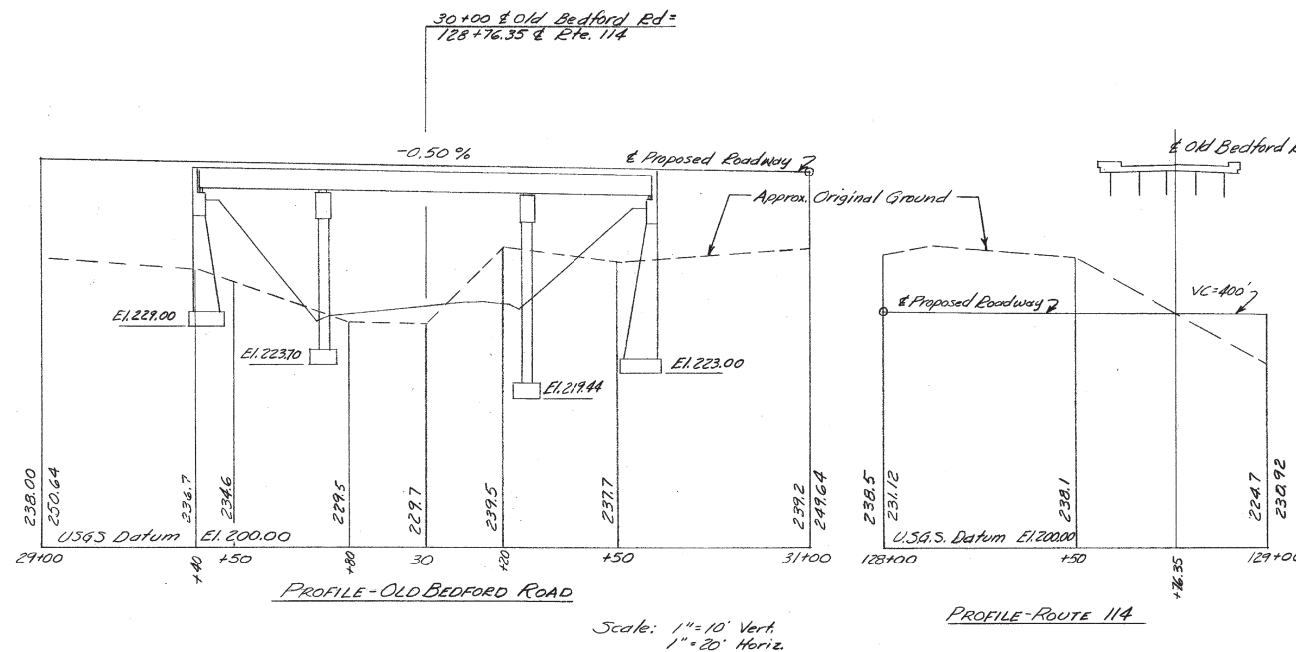


BORING LOG
Scale: 1"=10'



BORING LAYOUT
Scale: 1"=20'

BORING NOTES:
Borings indicated thus were made by N.H.D.P.W.S.H. in April 1964. Figures in the right hand column indicate the number of blows required to drive a 1 1/2" O.D. A-rod one foot using 140 pound weight falling 30 inches. Borings are for design purposes and show conditions of boring points only and do not necessarily indicate materials to be encountered during construction. Boring samples may be examined at the office of the Bridge Engineer State Office Building, 85 Loudon Road Concord, N.H.



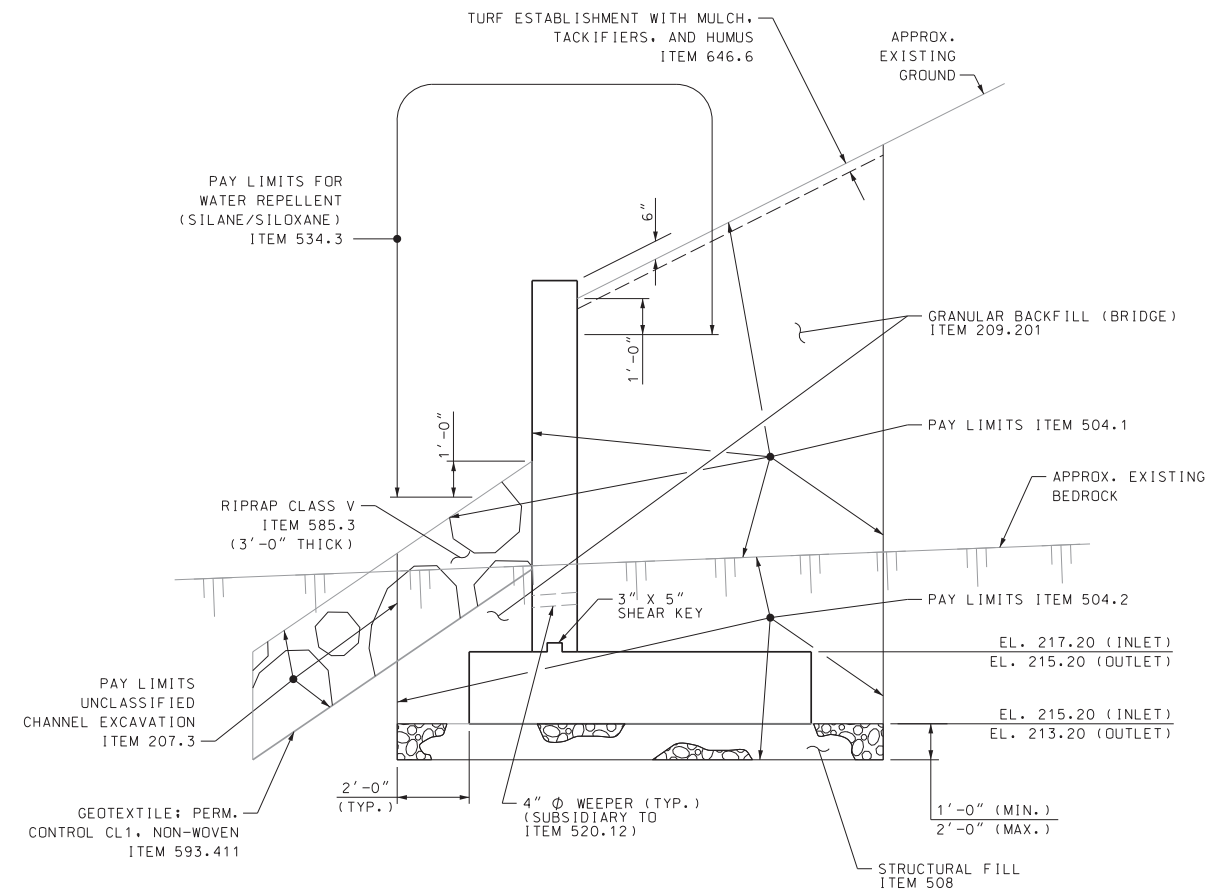
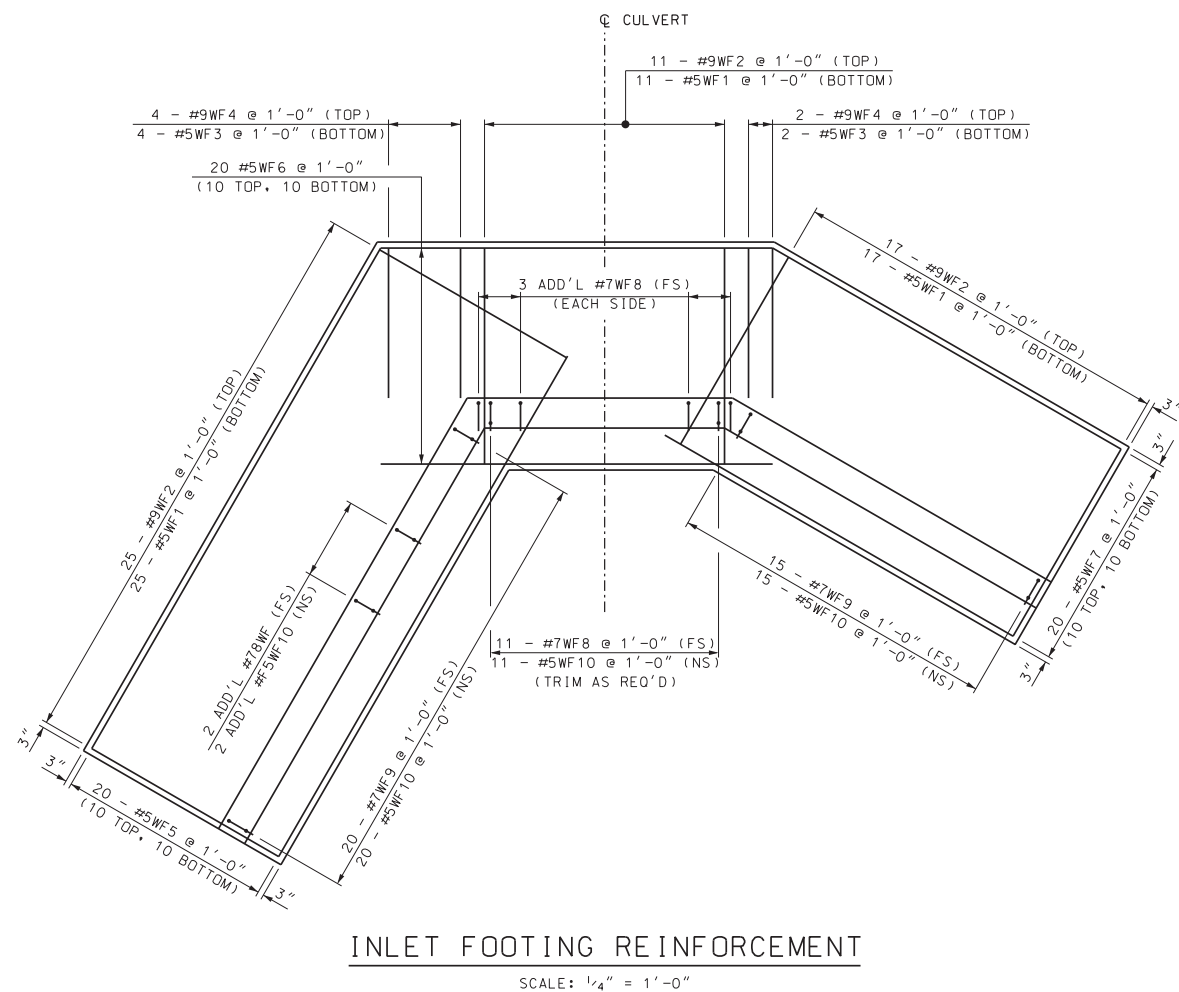
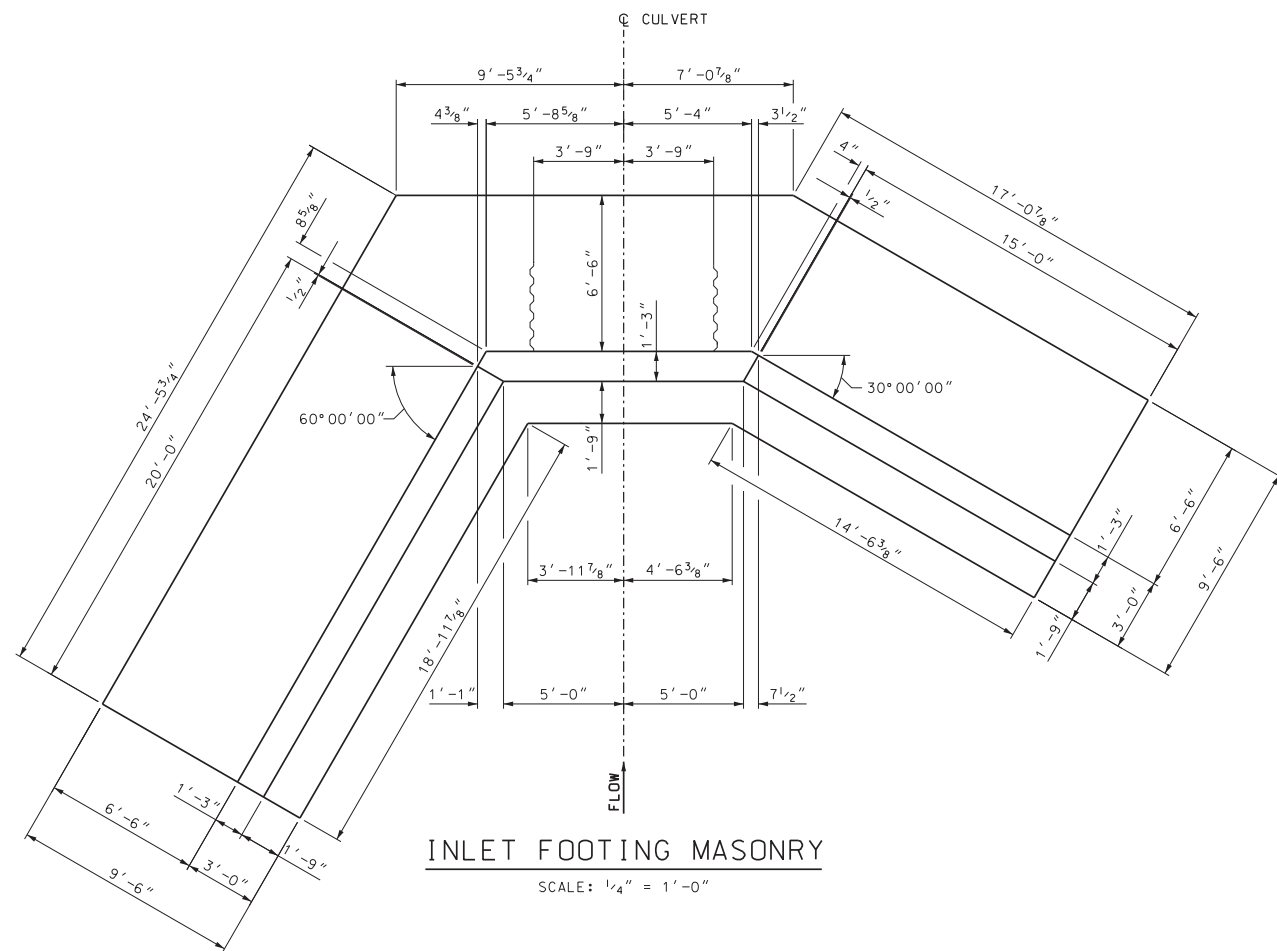
Scale: 1"=10' Vert.
1"=20' Horiz.

STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE DESIGN DIVISION			
TOWN BEDFORD (BEDFORD-TOWN)		BRIDGE NO. 151/152	
FEDERAL PROJECT 523(9)		STATE PROJECT D4988	
LOCATION Old Bedford Road, over Relocated Rte. 114, 0.50 Mile north of Intersection of Routes I-93 and 101.			
BORINGS, BORING LAYOUT & PROFILE			
DESIGNED	BY	DATE	BRIDGE SHEET NO.
DRAWN	BY	DATE	2 OF 14
TRACED	BY	DATE	FILE NUMBER
QUANTITIES	BY	DATE	3-10-1-3
REVIEWED BY	PROJ. NO.	SHEET NO.	TOTAL SHEETS
	523(9)	40	209

STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN			
TOWN BEDFORD	BRIDGE NO. 151/151	STATE PROJECT	16156
LOCATION NH ROUTE 114 OVER BOWMAN BROOK			
BORING LOGS (SHEET 4 OF 4)			BRIDGE SHEET 9 OF 17
REVISIONS AFTER PROPOSAL	BY	DATE	FILE NUMBER
DESIGNED	DEM	06/2017	128-3-2
DRAWN	TJW	06/2017	
QUANTITIES	TAT	06/2017	
ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE	X-A001 (160)	15	23



SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
XX	15_BoringLog 04	AS NOTED

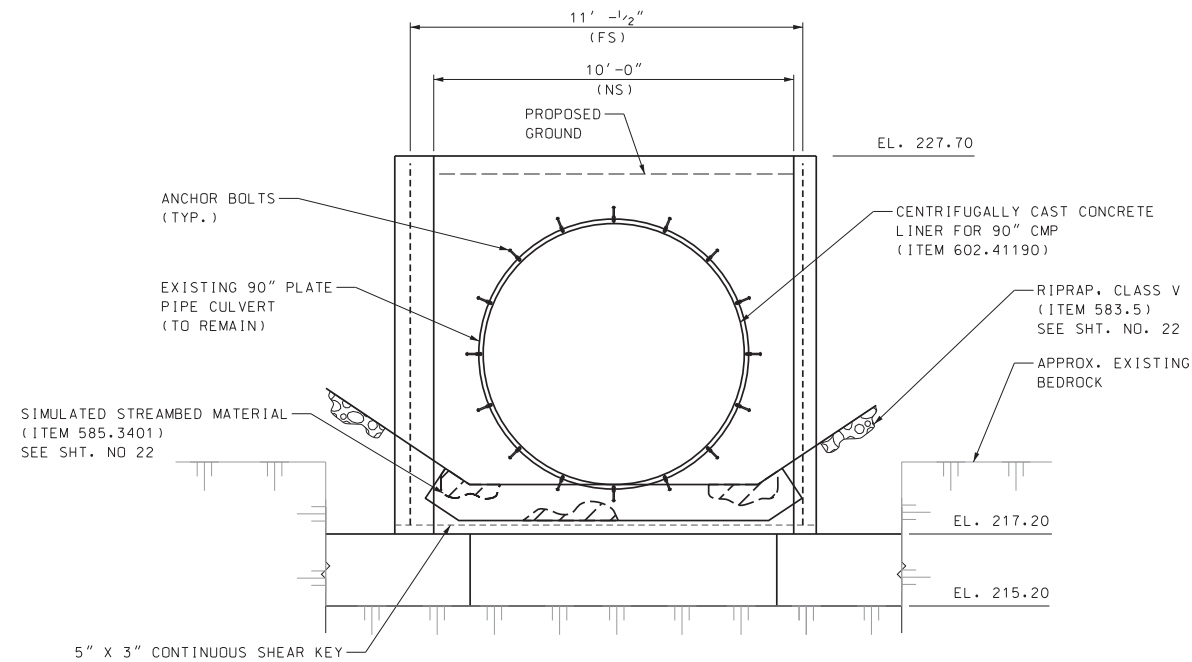


NOTE: WINGWALL SHOWN, HEADWALL SIMILAR

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156
LOCATION	NH ROUTE 114 OVER BOWMAN BRROK								
INLET FOOTING DETAILS								BRIDGE SHEET	
REVISIONS AFTER PROPOSAL				BY	DATE		BY	DATE	10 OF 17
			DESIGNED	JGS	08/2017	CHECKED	DEM	08/2017	FILE NUMBER
			DRAWN	TJG	08/2017	CHECKED	TAT	08/2017	128-3-2
			QUANTITIES	JGS	08/2017	CHECKED	TAT	08/2017	TOTAL SHEETS
			ISSUE DATE		FEDERAL PROJECT NO.			SHEET NO.	
			REV. DATE		X-A001 (160)			16	23

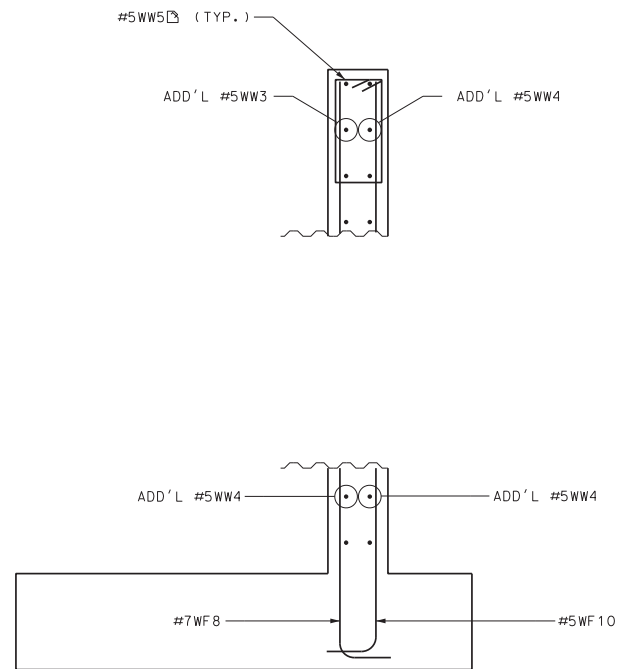


SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC\ABOUT A 16	INLET FOOTING DETAILS	AS NOTED



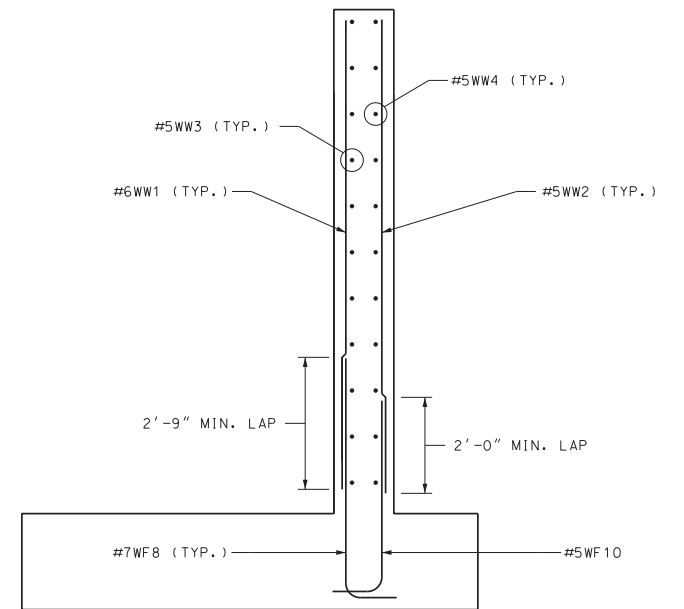
INLET HEADWALL MASONRY

SCALE: 3/8" = 1'-0"



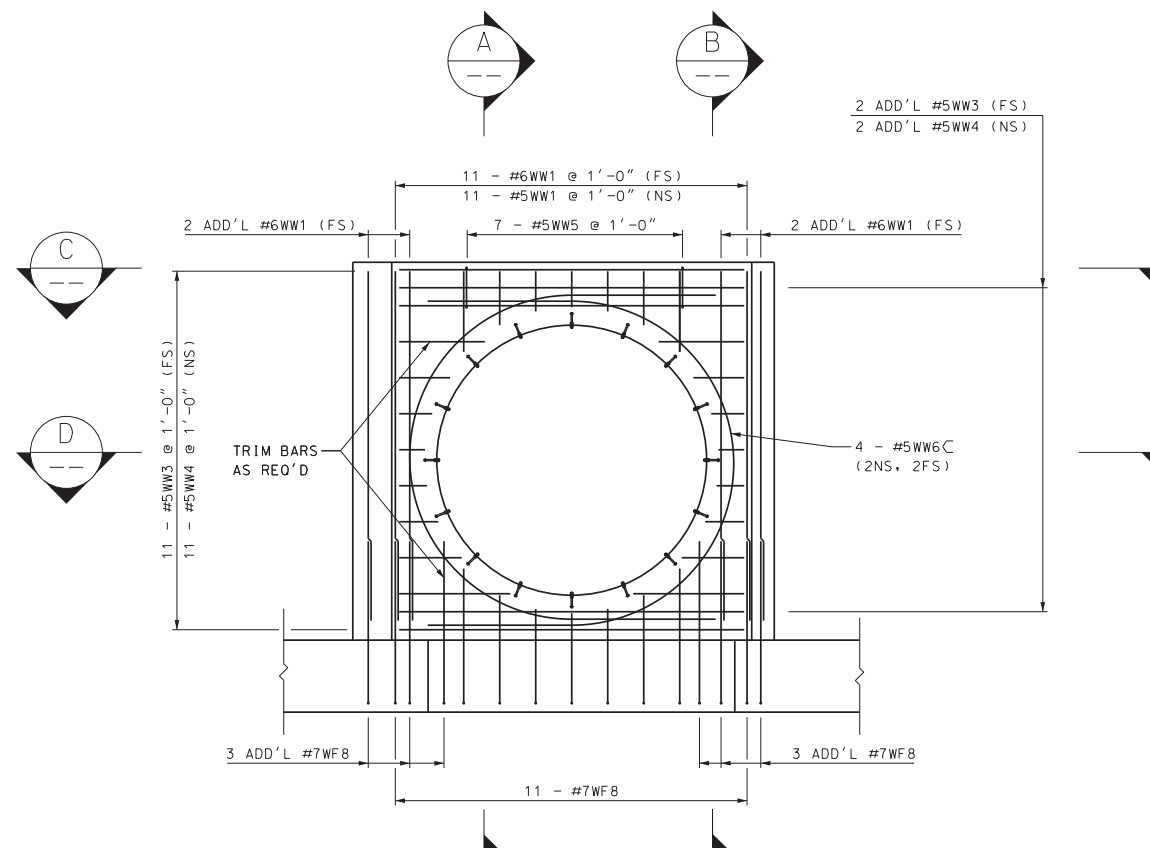
SECTION A

SCALE: 1/2" = 1'-0"



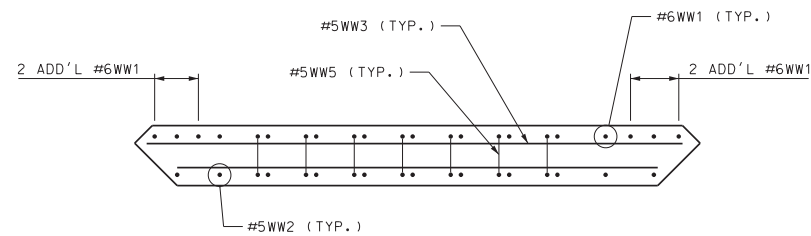
SECTION B

SCALE: 1/2" = 1'-0"



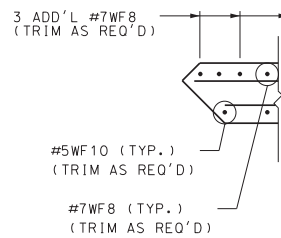
INLET HEADWALL REINFORCEMENT

SCALE: 3/8" = 1'-0"



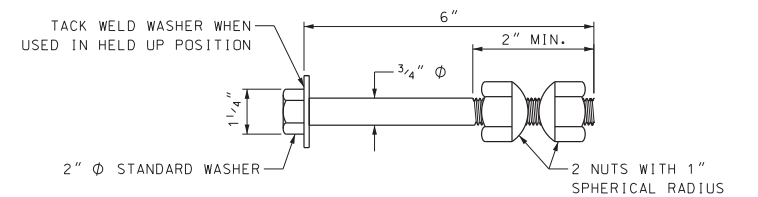
SECTION C

SCALE: 1/2" = 1'-0"



SECTION D

SCALE: 1/2" = 1'-0"



ANCHOR BOLT DETAIL

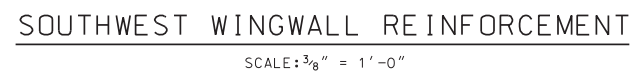
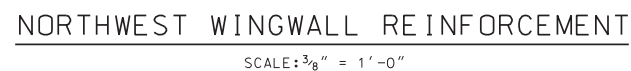
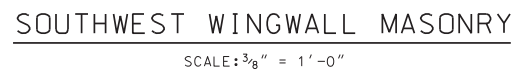
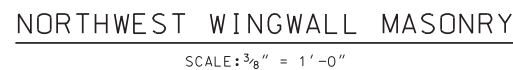
NOT TO SCALE

- NOTE:
- ANCHOR BOLTS SHALL BE SUBSIDIARY TO ITEM 520.12.
 - ALL ANCHOR BOLTS SHALL BE GALVANIZED STEEL MEETING THE REQUIREMENTS OF ASTM A-307 OR A-325 WITH ZINC COATING IN ACCORDANCE WITH ASTM 153 (INCLUDING THE NUTS AND WASHERS).
 - ANCHOR BOLTS SHALL BE CAST INTO CONCRETE HEADWALLS, SPACED AS SHOWN (32 REQ'D, 16 EACH HEADWALL).
 - TYPICAL TO BOTH INLET AND OUTLET HEADWALLS

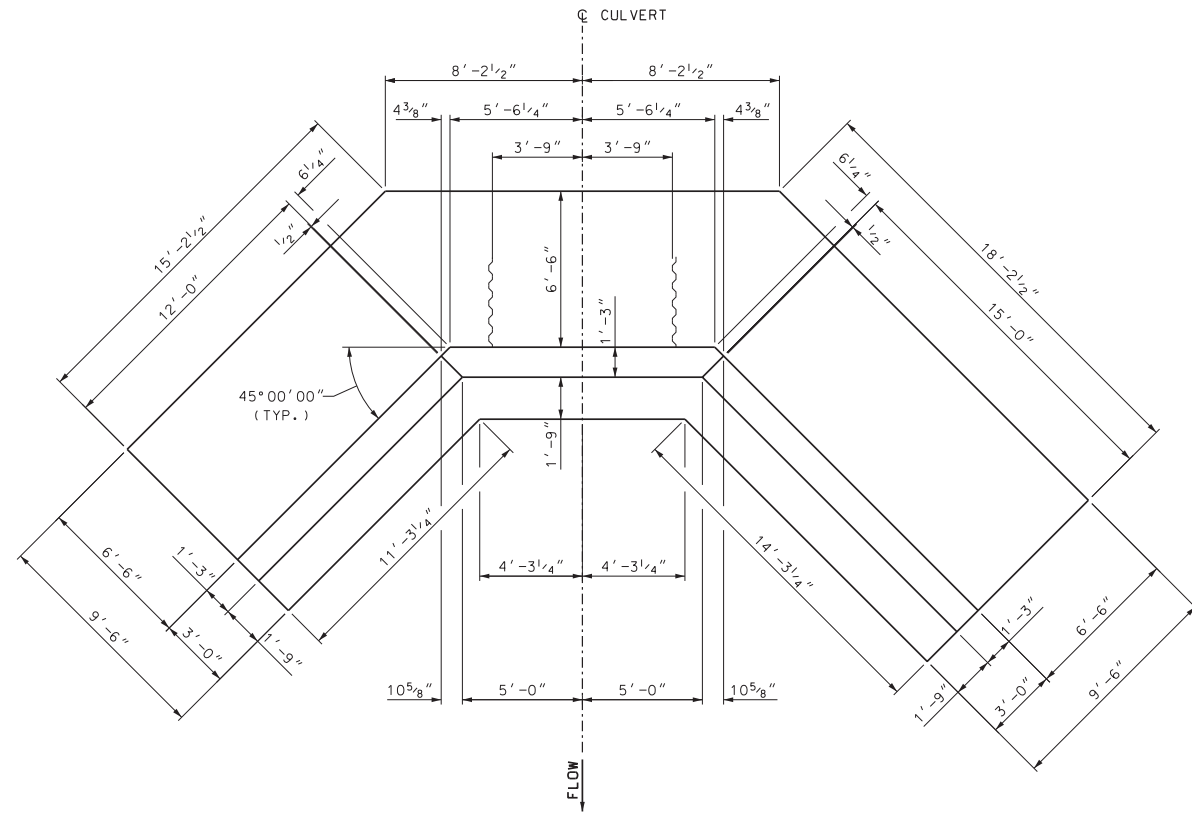


SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC\ABUT A	17_Inlet_Headwall_Details	AS NOTED

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD			BRIDGE NO.	151/151		STATE PROJECT	16156	
LOCATION	NH ROUTE 114 OVER BOWMAN BRROK								
INLET HEADWALL DETAILS								BRIDGE SHEET	
REVISIONS AFTER PROPOSAL				BY	DATE		BY	DATE	
			DESIGNED	JGS	08/2017		CHECKED	DEM	08/2017
			DRAWN	TJW	08/2017		CHECKED	TAT	08/2017
			QUANTITIES	JGS	08/2017		CHECKED	TAT	08/2017
			ISSUE DATE		FEDERAL PROJECT NO.			SHEET NO.	TOTAL SHEETS
			REV. DATE		X-A001 (160)			17	23

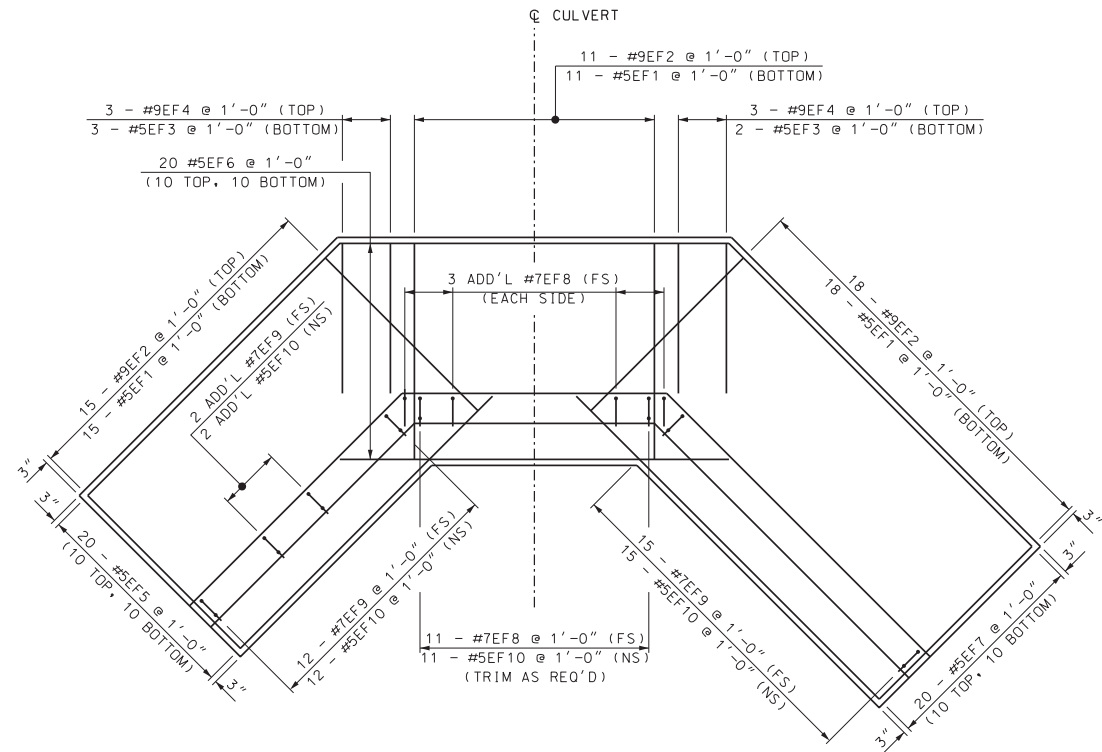


<div style="text-align: center;"> <h1>STATE OF NEW HAMPSHIRE</h1> <h2>DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN</h2> </div>											
TOWN BEDFORD			BRIDGE NO. 151/151			STATE PROJECT			16156		
LOCATION NH ROUTE 114 OVER BOWMAN BRROK											
<div style="text-align: center;"> <h3>INLET WINGWALL DETAILS</h3> </div>										BRIDGE SHEET	
REVISIONS AFTER PROPOSAL				BY	DATE	BY	DATE	12 OF 17			
DESIGNED				JGS	08/2017	CHECKED	DEM	08/2017	FILE NUMBER		
DRAWN				TJG	08/2017	CHECKED	TAT	08/2017	128-3-2		
QUANTITIES				JGS	08/2017	CHECKED	TAT	08/2017	TOTAL SHEETS		
ISSUE DATE				FEDERAL PROJECT NO.				SHEET NO.			
REV. DATE				X-A001 (160)				18		23	



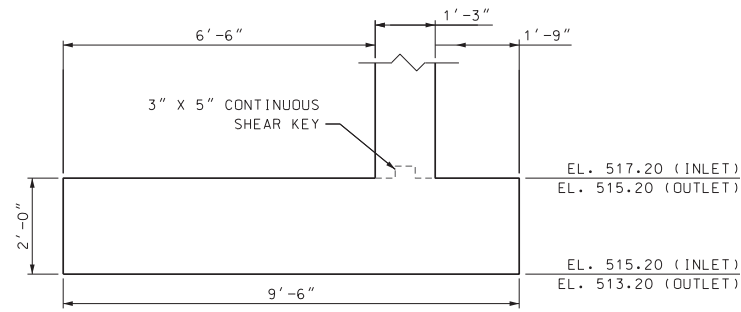
OUTLET FOOTING MASONRY

SCALE: 1/4" = 1'-0"



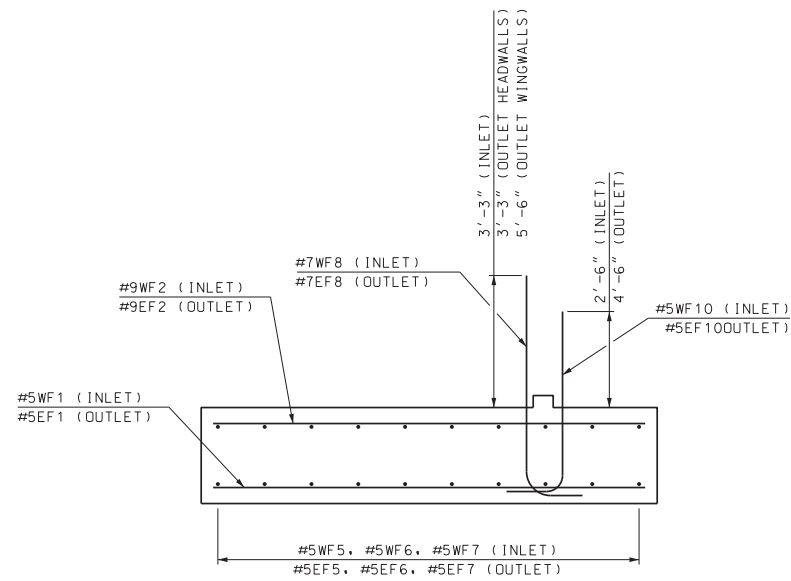
OUTLET FOOTING REINFORCEMENT

SCALE: 1/4" = 1'-0"



TYPICAL FOOTING SECTION

SCALE: 1/2" = 1'-0"



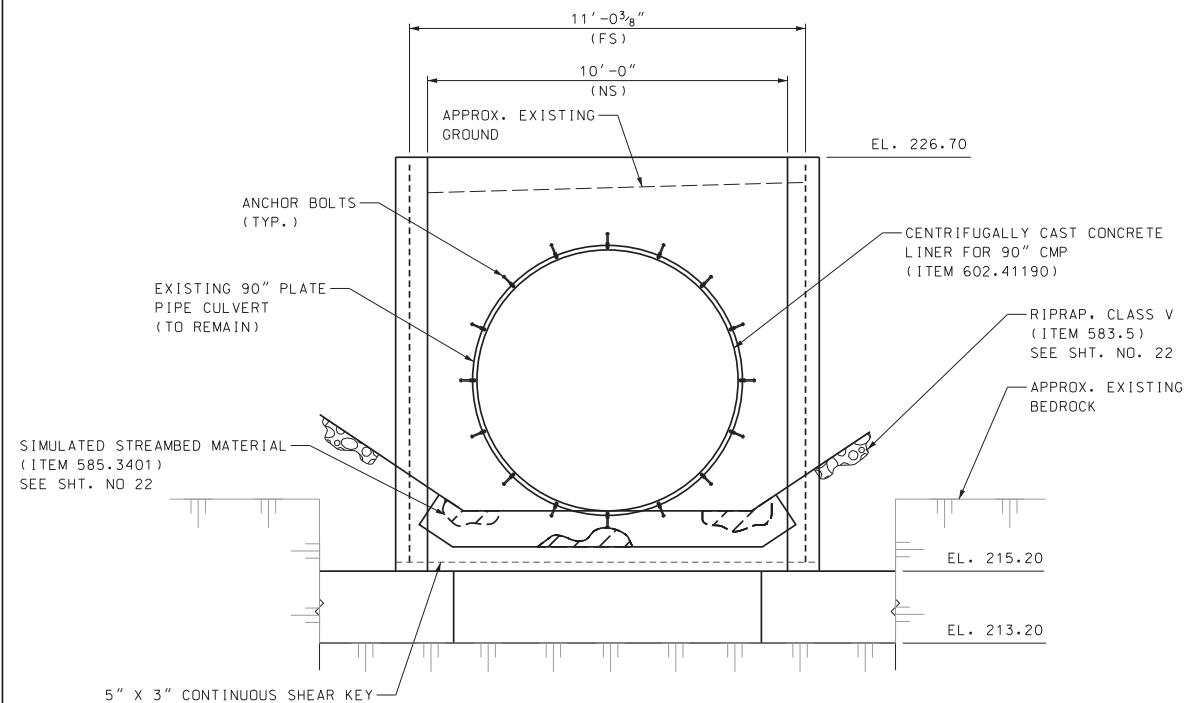
TYPICAL FOOTING REINFORCEMENT

SCALE: 1/2" = 1'-0"

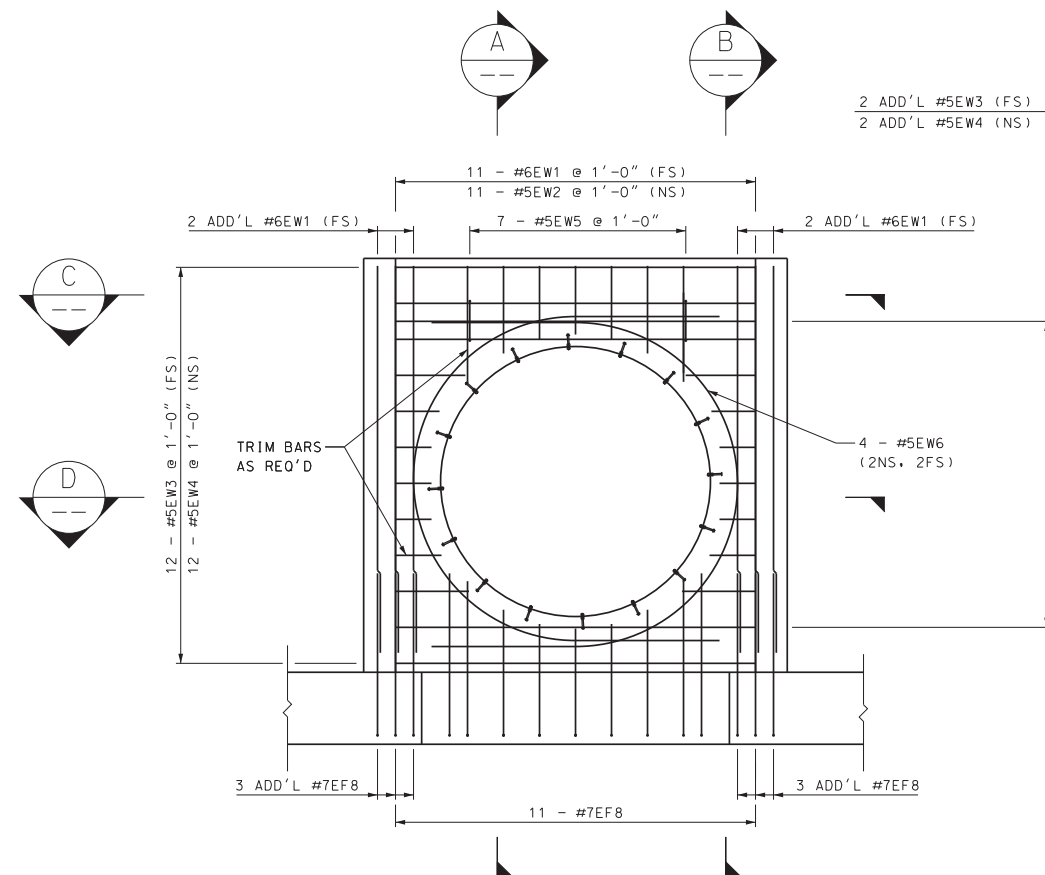


STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD	BRIDGE NO.		151/151		STATE PROJECT		16156	
LOCATION NH ROUTE 114 OVER BOWMAN BRROK									
OUTLET FOOTING DETAILS								BRIDGE SHEET	
REVISIONS AFTER PROPOSAL			BY	DATE		BY	DATE	13 OF 17	
			DESIGNED	JGS	08/2017	CHECKED	DEM	08/2017	FILE NUMBER
			DRAWN	TJG	08/2017	CHECKED	TAT	08/2017	128-3-2
			QUANTITIES	JGS	08/2017	CHECKED	TAT	08/2017	
			ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS
			REV. DATE		X-A001 (160)		19		23

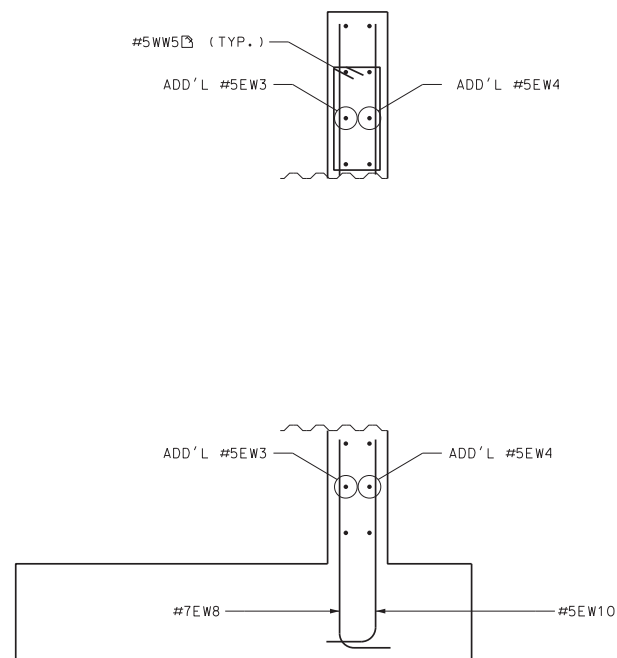
SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC\ABOUT A19_OUTLET FOOTING DETAILS	AS NOTED	



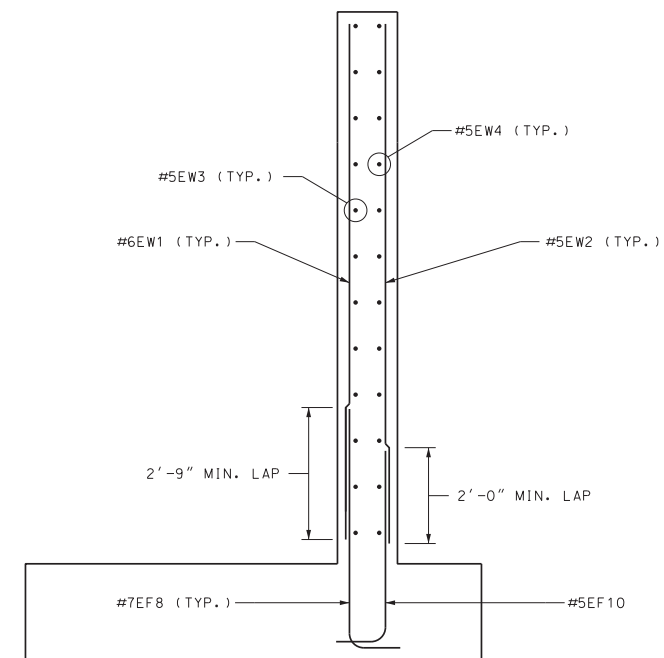
OUTLET HEADWALL MASONRY
SCALE: 3/8" = 1'-0"



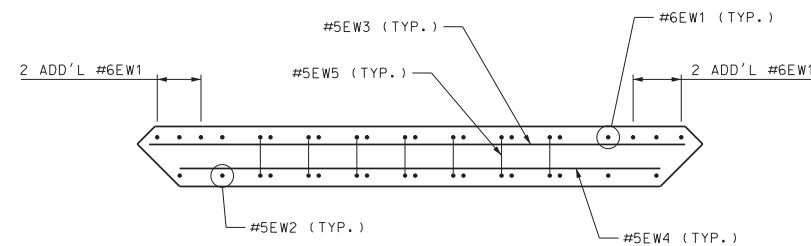
OUTLET HEADWALL REINFORCEMENT
SCALE: 3/8" = 1'-0"



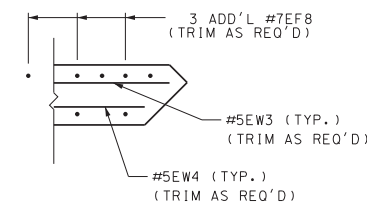
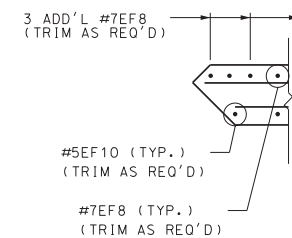
SECTION A
SCALE: 1/2" = 1'-0"



SECTION B
SCALE: 1/2" = 1'-0"



SECTION C
SCALE: 1/2" = 1'-0"

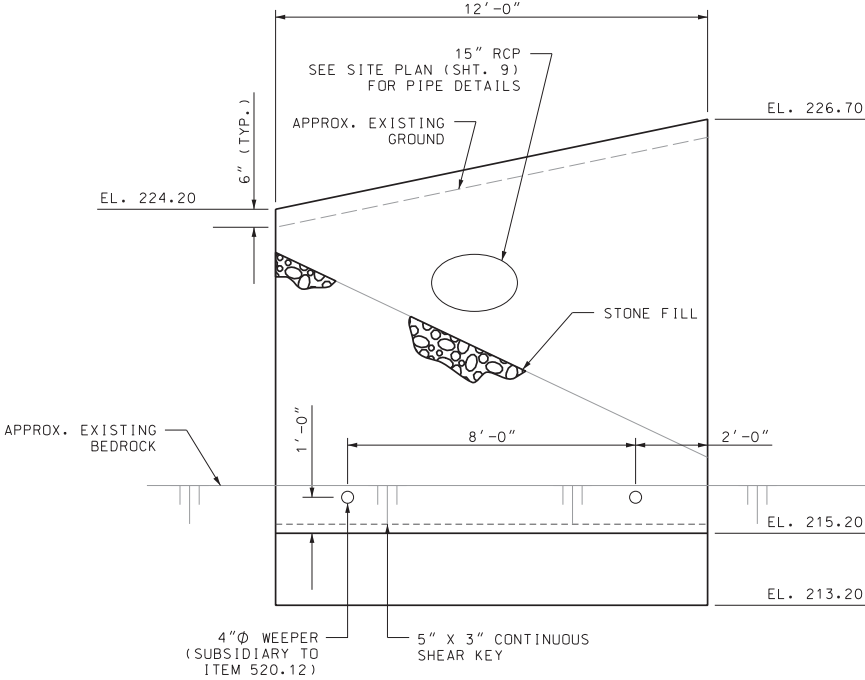


SECTION D
SCALE: 1/2" = 1'-0"



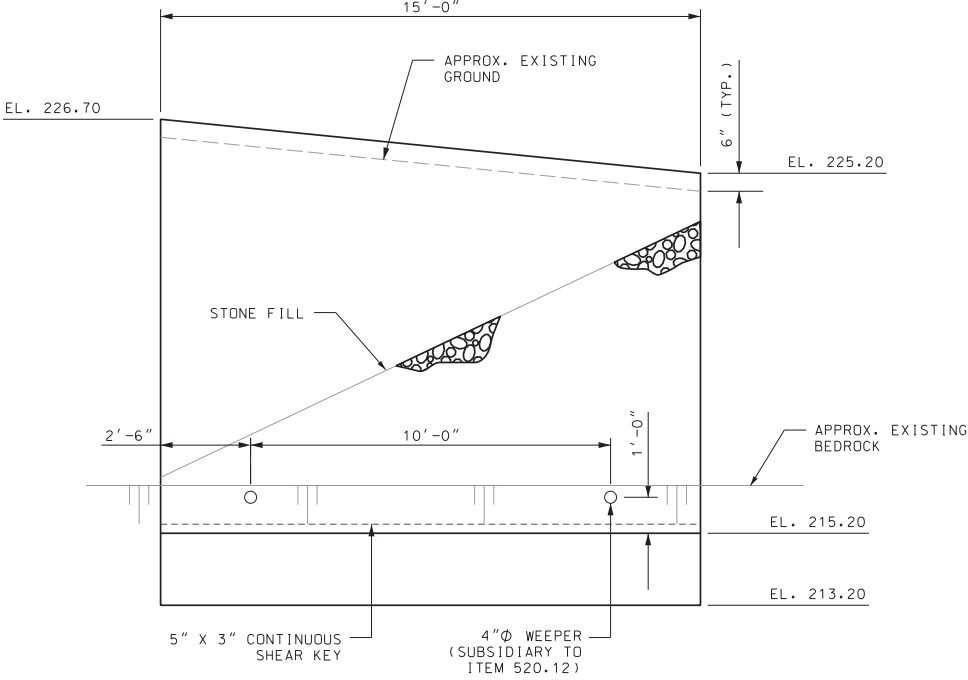
SUBDIRECTORY	DGN LOCATOR	SHEET SCALE
BRC\ABUT A	20_Outlet_Headwall_Details	AS NOTED

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156
LOCATION NH ROUTE 114 OVER BOWMAN BRROK									
OUTLET HEADWALL DETAILS								BRIDGE SHEET	
REVISIONS AFTER PROPOSAL			BY		DATE		BY		DATE
			DESIGNED	JGS	08/2017	CHECKED	DEM	08/2017	14 OF 17
				TJW	08/2017	CHECKED	TAT	08/2017	FILE NUMBER
			QUANTITIES	JGS	08/2017	CHECKED	TAT	08/2017	128-3-2
			ISSUE DATE		FEDERAL PROJECT NO.			SHEET NO.	
			REV. DATE		X-A001 (160)			20	
								TOTAL SHEETS	
								23	



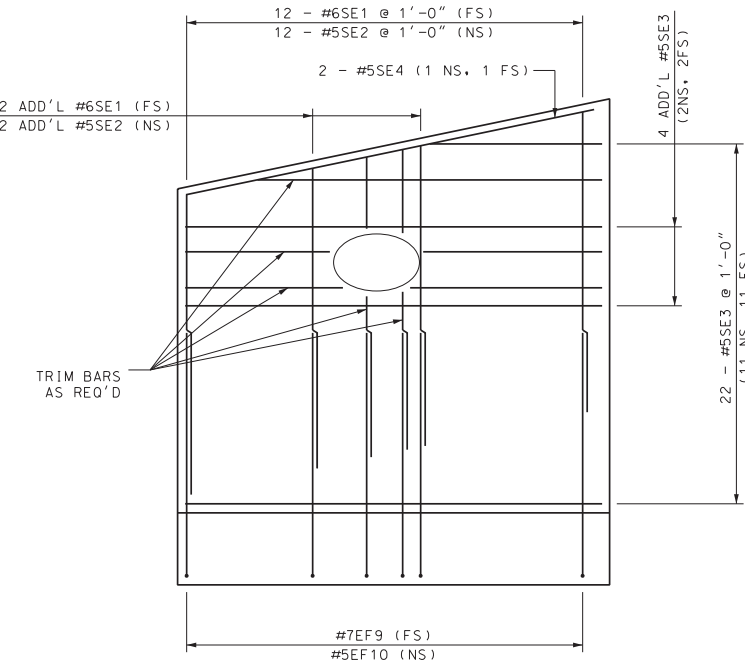
SOUTHEAST WINGWALL MASONRY

SCALE: 3/8" = 1'-0"



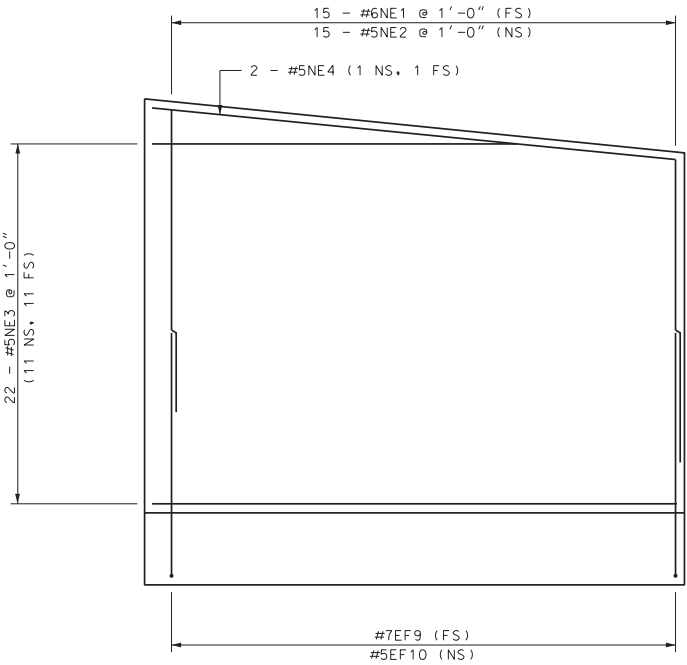
NORTHEAST WINGWALL MASONRY

SCALE: 3/8" = 1'-0"



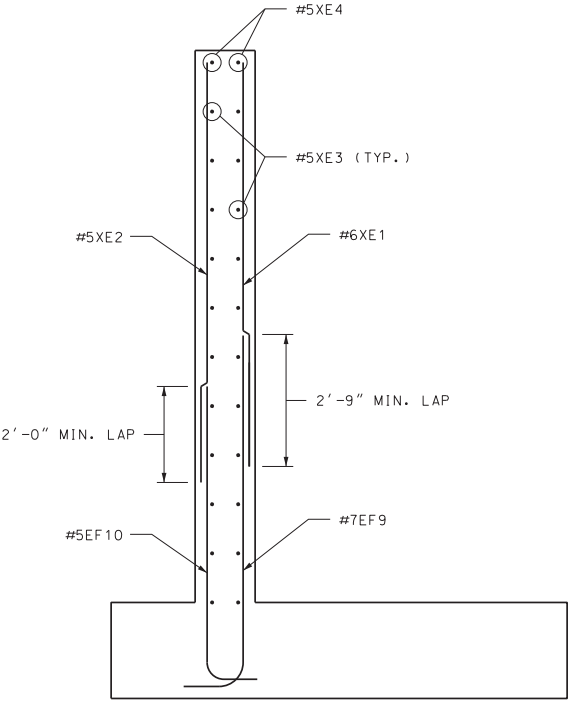
SOUTHEAST WINGWALL
RE INFORCEMENT

SCALE: 3/8" = 1'-0"



NORTHEAST WINGWALL
RE INFORCEMENT

SCALE: 3/8" = 1'-0"

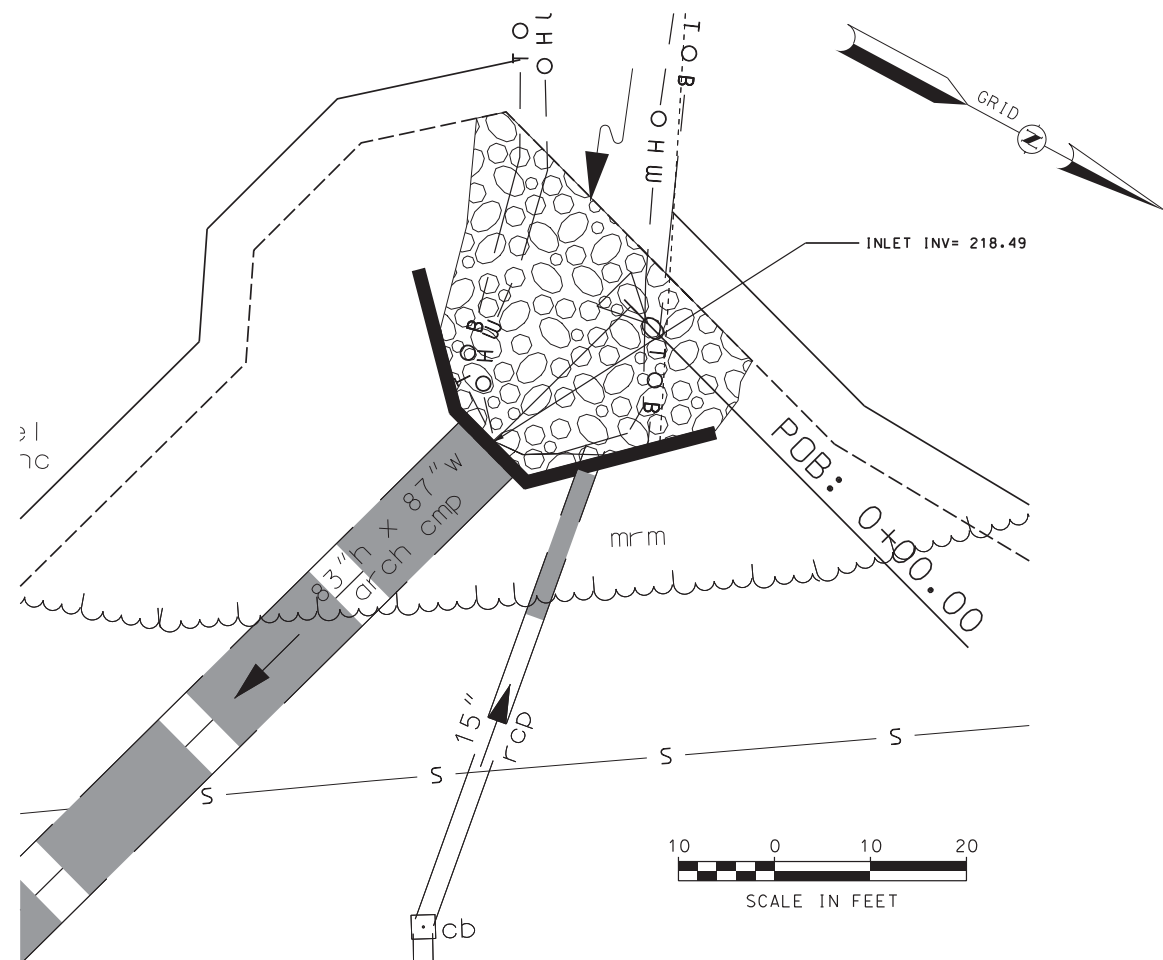


TYPICAL REINFORCEMENT SECTION

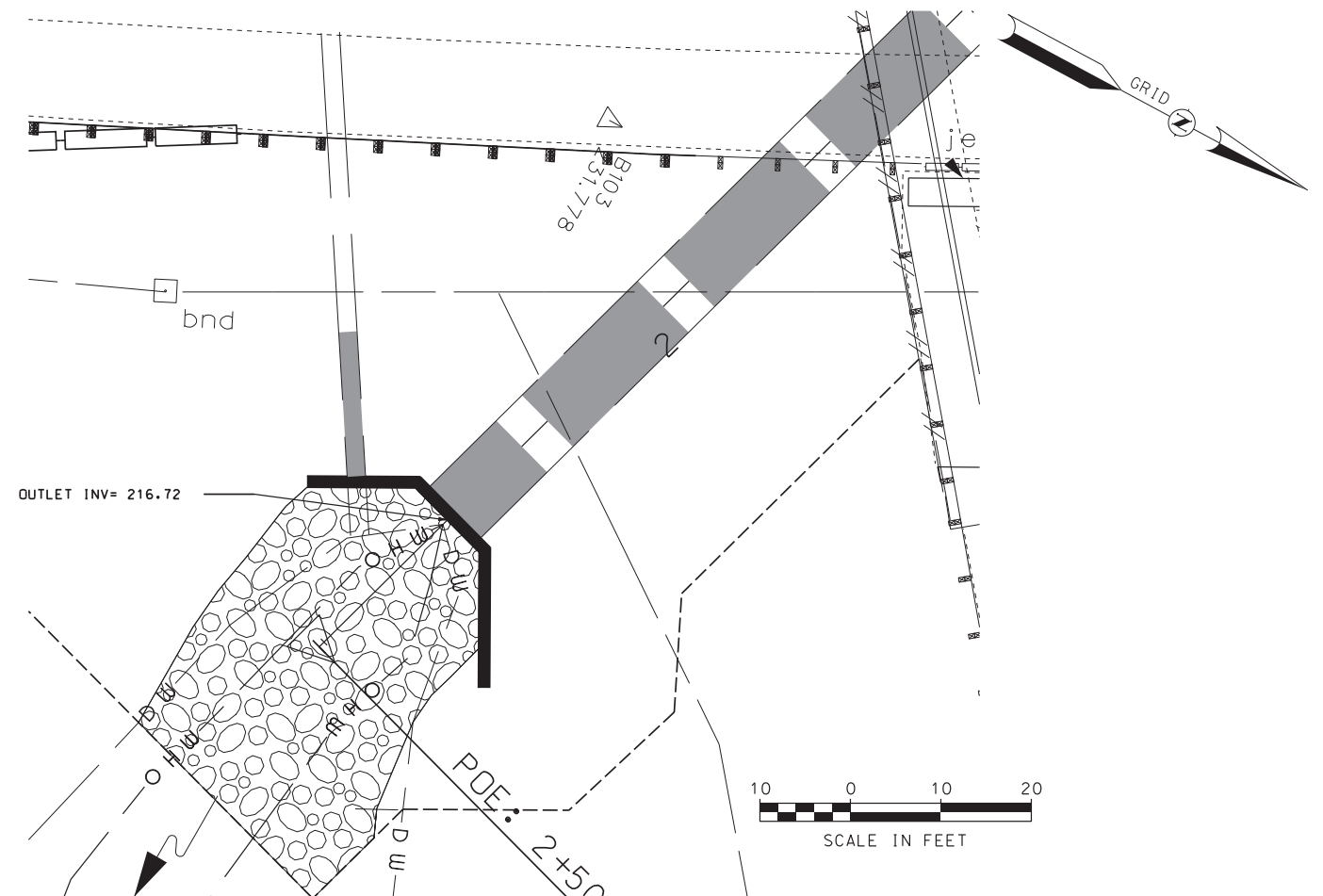
SCALE: 1/2" = 1'-0"



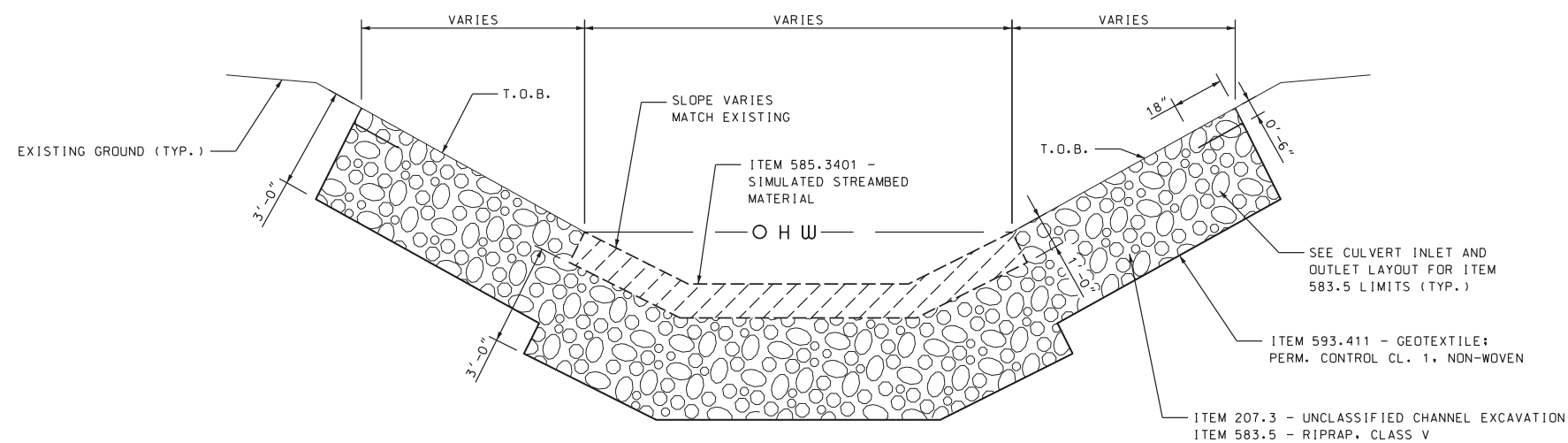
STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	BEDFORD	BRIDGE NO.		151/151		STATE PROJECT		16156	
LOCATION NH ROUTE 114 OVER BOWMAN BRROK									
OUTLET WINGWALL DETAILS								BRIDGE SHEET	
REVISIONS AFTER PROPOSAL		BY		DATE		BY		DATE	
		DESIGNED		JGS		08/2017		CHECKED	
		DRAWN		TJG		08/2017		CHECKED	
		QUANTITIES		JGS		08/2017		CHECKED	
		ISSUE DATE				FEDERAL PROJECT NO.		SHEET NO.	
		REV. DATE				X-A001 (160)		21	
								TOTAL SHEETS	
								15 OF 17	
								FILE NUMBER	
								128-3-2	
								TOTAL SHEETS	
								23	



CULVERT INLET LAYOUT



CULVERT OUTLET LAYOUT



CULVERT INLET & OUTLET
TYPICAL SECTION w/ SIMULATED STREAMBED MATERIAL
(NOT TO SCALE)



SUBDIRECTORY	.DGN LOCATOR	SHEET SCALE
XX	22_culvert_details	AS NOTED

STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN	BEDFORD		BRIDGE NO.		151/151		STATE PROJECT		16156	
LOCATION	NH ROUTE 114 OVER BOWMAN BROOK									
CULVERT INLET AND OUTLET DETAILS								BRIDGE SHEET		
REVISIONS AFTER PROPOSAL			BY		DATE		BY		DATE	
			DESIGNED	DEM	06/2017	CHECKED	TAT	06/2017	16 OF 17	
			DRAWN	TJW	06/2017	CHECKED	TAT	06/2017	FILE NUMBER	
			QUANTITIES	TAT	06/2017	CHECKED	DEM	06/2017	128-3-2	
			ISSUE DATE		FEDERAL PROJECT NO.			SHEET NO.		TOTAL SHEETS
			REV. DATE		X-A001 (160)			22		23

INLET FOOTING					BRIDGE SHEET 10 OF 17												
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
WF1	#5	9'-0"	53	STR													
WF2	#9	9'-0"	53	STR													
WF3	#5	6'-3"	6	STR													
WF4	#9	6'-3"	6	STR													
WF5	#5	24'-0"	20	STR													
WF6	#5	16'-4"	20	STR													
WF7	#5	16'-9"	20	STR													
WF8	#7	6'-2"	17	N8		5'-0"	1'-2"										
WF9	#7	6'-2"	37	N8		5'-0"	1'-2"										
WF10	#5	5'-1"	48	N8		4'-3"	0'-10"										
SECTION SUMMARY TOTAL WEIGHT (lbs):																	
ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL				
544	REINFORCING STEEL			1982		682		1750					4414				
544.11	MECH. CONNECTOR																
544.2	EPOXY COATED																
544.21	EPOXY MECH. CONN.																

OUTLET FOOTING										BRIDGE SHEET 13 OF 17							
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
EF1	#5	9'-0"	44	STR													
EF2	#9	9'-0"	85	STR													
EF3	#5	6'-3"	6	STR													
EF4	#9	6'-3"	12	STR													
EF5	#5	24'-0"	20	STR													
EF6	#5	16'-4"	20	STR													
EF7	#5	16'-9"	20	STR													
EF8	#7	6'-2"	17	N8		5'-0"	1'-2"										
EF9	#7	8'-5"	29	N8		7'-3"	1'-2"										
EF10	#5	7'-1"	40	N8		6'-3"	0'-10"										
SECTION SUMMARY TOTAL WEIGHT (lbs):																	
ITEM #	DESCRIPTION			#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL		
544	REINFORCING STEEL					1939		714		2856					5509		
544.11	MECH. CONNECTOR																
544.2	EPOXY COATED																
544.21	EPOXY MECH. CONN.																

INLET HEADWALL					BRIDGE SHEET 11 OF 17												
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
WW1	#6	9'-9"	15	STR													
WW2	#5	9'-6"	11	STR													
WW3	#5	10'-10"	13	STR													
WW4	#5	9'-11"	13	STR													
WW5	#5	5'-0"	7	T1	0'-6"	0'-10"	1'-2"	0'-10"	1'-2"		0'-6"						
WW6	#5	21'-4"	4	10	4'-0"	13'-4"	4'-0"								4'-3"		

OUTLET HEADWALL										BRIDGE SHEET 14 OF 17							
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
EW1	#6	10' -9"	15	STR													
EW2	#5	10' -9"	11	STR													
EW3	#5	11' -0"	14	STR													
FW4	#5	9' -11"	14	STR													
EW5	#5	5' -0'	7	T1	0' -6"	0' -10"	1' -2"	0' -10"	1' -2"		0' -6"						
EW6	#5	21' -4"	4	10	4' -0"	13' -4"	4' -0"								4' -3"		
SECTION SUMMARY TOTAL WEIGHT (lbs):																	
ITEM #	DESCRIPTION	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18	TOTAL				
544	REINFORCING STEEL			555	243								798				
544.11	MECH. CONNECTOR																
544.2	EPOXY COATED																
544.21	EPOXY MECH. CONN.																

INLET NORTHWEST WINGWALL										BRIDGE SHEET 12 OF 17							
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
NW1	#6	9'-9"	22	STR													
NW2	#5	9'-6"	22	STR													
NW3	#5	19'-7"	24	STR													
NW4	#5	19'-7"	2	STR													

OUTLET NORTHEAST WINGWALL										BRIDGE SHEET 15 OF 17							
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
NE1	#6	8'-6"	15	STR													
NE2	#5	8'-6"	15	STR													
NE3	#5	14' -7"	22	STR													
NE4	#5	14' -7"	2	STR													
									</								

INLET SOUTHWEST WINGWALL										BRIDGE SHEET 12 OF 17							
Mark	Size	Length	# Pieces	Type	A	B	C	D	E	F	G	H	J	K	R	O	
SW1	#6	9'-9"	15	STR													
SW2	#5	9'-6"	15	STR													
SW3	#5	14'-7"	20	STR													
SW4	#5	14'-7"	2	STR													